



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

### Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

### About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

Sc 116 351 8.5



Harvard College Library

FROM

Michigan State Library







TWENTY-FIFTH ANNUAL REPORT

OF THE

MICHIGAN

DAIRYMEN'S ASSOCIATION

---

JULY 1, 1908, TO JUNE 30, 1909

---

COMPILED BY  
S. J. WILSON  
SECRETARY



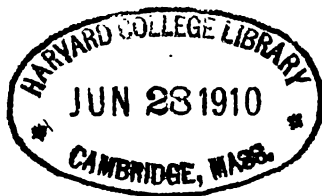
---

BY AUTHORITY

---

LANSING, MICHIGAN  
WYNKOOP HALLENBECK CRAWFORD CO., STATE PRINTERS  
1909

Sc 1635.18.5  
~~V. 6411~~



*Michigan State Library*

## LETTER OF TRANSMITTAL.

---

Michigan Dairymen's Association,  
Office of the Secretary.

Flint, Mich., July 1, 1909.

To His Excellency, Fred M. Warner, Governor of the State of Michigan:

I have the honor to submit herewith, as required by statute, the accompanying report of the Michigan Dairymen's Association, showing the receipts and disbursements for the year; also papers and stenographic report of the Twenty-fifth Annual Convention, held at Grand Rapids, Feb. 17th, 18th, and 19th, 1909; also the auxiliary meetings held at Tecumseh, Salem, Cranston, and Traverse City.

Respectfully yours,

S. J. WILSON,  
Secretary.



OFFICERS OF THE  
MICHIGAN DAIRYMEN'S ASSOCIATION.

TO JUNE 30, 1909.

---

PRESIDENT.

COLON C. LILLIE .....Coopersville

VICE PRESIDENTS.

W. H. BECHTEL, First Vice President.....Caro  
A. L. WRIGHT .....Bad Axe  
J. LAVERTY .....Jackson  
N. HORTON .....Fruit Ridge  
GEO. A. TRUE .....Armada  
JOHN BROUWERS .....Zeeland  
C. I. CURRY .....Otsego  
GEO. ELLIOTT .....Troy  
D. McMULLEN .....Traverse City  
W. SCHLICHTER .....Brown City  
E. A. BLAKESLEE .....Galien  
S. R. MILES .....Buchanan

SECRETARY AND TREASURER.

S. J. WILSON .....Flint

CHEMISTS.

DR. C. E. MARSHALL.....Agricultural College  
VICTOR C. VAUGHAN, Dean of U. of M.....Ann Arbor

DIRECTORS.

W. F. RAVEN .....Brooklyn  
C. C. COLVIN .....Medina  
HELMER RABILD .....Alma  
C. R. WEBB .....Chesaning  
HENRY ROZEMA .....Fremont



# MEMBERS OF THE MICHIGAN DAIRYMEN'S ASSOCIATION.

## LIFE MEMBERS.

Bates, Hon. E. N.....Moline  
Haven, E. A.....Bloomington  
Horton, Hon. G. B.....Fruit Ridge  
Lillie, Colon C.....Coopersville  
Marshall, Dr. C. E.....East Lansing  
Monrad, J. H.....Copenhagen, O. Denmark  
McBride, James N.....Burton  
Smith, Director C. D., Piracicaba,  
Province of St. Paul, Brazil, South  
.....America

Stowe, E. A.....Grand Rapids  
Vaughan, Victor C., Dean of U. of M.  
.....Ann Arbor  
Warner, Gov. Fred M.....Farmington  
Wilson, S. J.....Flint  
Wright, A. W.....Alma

## ANNUAL MEMBERS.

July 1, 1908, to June 30, 1909.

Adams, A. J., R. D. 4.....Shelby  
Adams, E. G.....Hilliards  
Albion Cry. Co.....Albion  
Amerman, H. A.....Flushing  
Anderson, A. C.....East Lansing  
Anderson, A. C., R. D. 5.....Shelby  
Anderson, Anders, 55 Jefferson Ave.  
.....Grand Rapids  
Anderson, G. O., R. D. 2.....Shelby  
Andrews, T. F.....Grand Rapids  
Armstrong, Andrew J.....Cedar Springs  
Armstrong, M. B.....Pontiac  
Armstrong, W. A.....Concord  
Augevine, C. J.....Coldwater  
Austin, Eugene.....Coopersville  
Austin, R. C.....Deckerville  
Baer, U. S.....Madison, Wis.  
Baker, T. H.....Flint  
Bakkensen, K. C.....Coloma  
Baldwin, J. F., Agt. N. Y. D. R.  
Line.....Detroit  
Ballard, Harry.....Niles  
Bank, F. W.....Bloomington  
Bardwell, Fred.....Cass City  
Barger, Fred C., 158 Franklin St.  
.....New York, N. Y.  
Barnes, Volkert, R. D. 1.....Newaygo  
Barrett, C. H., Co.....Owosso  
Bascom, S. A.....Albion  
Batten, John.....Avoca

Bay City Creamery.....Bay City  
Bechtel, W. H.....Caro  
Beem, John M.....Reeman  
Benson, C. C., Box 11.....Lansing  
Best Bros. ....Iron Mountain  
Best, Wellington, 84 Ionia St.....  
.....Grand Rapids  
Biersborn, Harry, R. D. 3..Mt. Clemens  
Birdsall, D. B.....Adrian  
Birdsall, T. N.....Tecumseh  
Blakeslee, E. A.....Galien  
Blood, F. J.....Bloomer, Wis.  
Blumlein, Wm.....Frankenmuth  
Bockelman, Fred, care Coyne Bros.  
.....Chicago, Ill.  
Boehmcke, F. E., 300 Greenwich St.  
.....New York, N. Y.  
Bolter, A. H.....Lansing  
Bosch, Chas., R. D. 5.....Hudsonville  
Bos, A. ....Hudsonville  
Bosworth, Carleton W., 381 Crescent  
Ave. ....Grand Rapids  
Bosworth, Jesse L.....Colon  
Bovee, Guy A.....Woodland  
Bovee, Windsor .....Middleville  
\*Bowman, Arthur, R. D. 4 (2 years)  
.....Hudsonville  
Breck, John I.....Jackson  
Briggs, C. S., R. D. 9, Station B.  
.....Grand Rapids

Briggs, J. N. .... Portland  
 Briggs, Wm. E., R. D. 9. .... Grand Rapids  
 Bristol, O. L. .... Eureka  
 Brooks, R. A., care Tank & Silo Co. .... Kalamazoo  
 Brooklyn Creamery Co. .... Brooklyn  
 Brown, J. H. .... Battle Creek  
 Brownell, W. M., 309 Broadway. .... New York, N. Y.  
 Bryant & Murray, R. D. 1. .... Utica  
 Buhrer, John D., care Corn Products Ref. Co. .... Chicago, Ill.  
 Burns, W. S., care Burns Creamery .... Grand Rapids  
 Britten, Arthur H. .... Goodrich  
 Carland Cheese Co. .... Carland  
 Carlsen, Emery E., 18 S. 9 Carrol St. .... Muskegon  
 Carpenter, J. S., R. D. 18. .... Ovid  
 Central Mich. Product Co. .... Alma  
 Chamberlain, F. M. .... Ann Arbor  
 Cheverie, F. A. .... Imlay City  
 Clack, H. W. .... Bargsersville, Ind.  
 Clement, — .... Kalamazoo  
 Cobb, Jesse W. .... Lawrence  
 Conant, A. B. .... North Adams  
 Collins, Frank L., care Michigan Farmer .... Detroit  
 Colvin, I. E. .... Hudson  
 Concklin, M. J., 416 N. 6 St. .... Saginaw  
 Conrad, Seth .... Wayland  
 Coon, F. H. .... Hemlock  
 Cooper, Cephas F., R. D. 4. .... Cassopolis  
 Coyne, R. J., 161 S. Water St. .... Chicago, Ill.  
 Crawford, T. B. .... Almont  
 Creamery Package Mfg. Co., 182 E. Kinzie St. .... Chicago, Ill.  
 Crittenden, C. M., R. D. 5. .... Mt. Clemens  
 Curtis & Curtis. .... De Witt  
 Cushman, M. A., 450 E. Illinois St. .... Chicago, Ill.  
 Daly, Andrew B., R. D. 2. .... Ray, Ind.  
 Dairy Record. .... St. Paul, Minn.  
 Darley, Hiram H. .... Coopersville  
 Davis, C. H., care D. C. Salt Co. .... St. Clair  
 Davis, Mrs. J. L. .... Crosby  
 Davis, Isaac W., Co. .... Phila., Pa.  
 Deaks, Clayton, R. D. 1. .... Salem  
 Dear, Chas. Henry .... Novi  
 Dear, W. A. .... Perrington  
 Dennis, J. H. .... Novi  
 Diehm, J. J. .... Remus  
 Doran, Wm. .... Ithaca  
 Doten, J. S. .... Hubbardston  
 Dubendorf, Wm. .... Coopersville  
 Dwelle, Franklin .... Grass Lake  
 Ebmeyer, John T. .... Burnips Corners  
 Edison, Harry, R. D. 2. .... Grand Rapids  
 Edison, Mrs. M. H., R. D. 2. .... Grand Rapids  
 Edinger, Peter .... Fowler  
 Elscheld, W. H. .... Casnovia

Ellis, O. A. .... Davis  
 Elmer, Ellsworth O. .... Devereaux  
 Ellwanger, R. J. .... De Witt  
 Ericsson, Elov. .... St. Paul  
 Faber, A. H., R. D. 4. .... Zeeland  
 Faber, John H. .... Zeeland  
 Faber, H. H., R. D. 2. .... Zeeland  
 Fay, Fred., 15 Harrison St. .... New York, N. Y.  
 Felker, L. W. .... Martin  
 Ferguson, A. L. .... Big Rapids  
 Ferguson, F. L. .... Berville  
 Ferris, E. T. .... Henderson  
 Finch, C. A., R. D. 6. .... Paw Paw  
 Fitch, Porter, care Fitch-Cornell. .... New York, N. Y.  
 Fitzpatrick, H. P. .... Middleton  
 Frary, R. F. .... Lapeer  
 Freeman, Leonard .... Fenton  
 Friday, S. B. .... Brandon, Wis.  
 Fuller, E. M. .... Montague  
 Geissel, J. C., 26 Harrison St. .... New York, N. Y.  
 Gibson, Joseph, 165 Broadway. .... New York, N. Y.  
 Gilbert, J. B. .... Webberville  
 Gilson, R. D. .... Toledo, Ohio  
 Glasser, G. H. .... Bancroft  
 Corill, R. S. .... Grand Rapids  
 Gregory, M. C. .... Unadilla, N. Y.  
 Griffith, M. J. .... Peck  
 Grove, Claude A. .... Litchfield  
 Grove, Otto .... Dorr  
 Hadley, B. F. .... Marlette  
 Hagedorn, Simon .... Fenton  
 Haggerty, Jesse E. .... White Pigeon  
 Hall, Lewis B., R. D. 10. .... Grand Rapids  
 Hall, Walter .... Elsie  
 Halpin, T. C. .... Vassar  
 Hamilton, D. W. .... Wayne  
 Hansen, L. P. .... Bronson  
 Harris, Gilbert .... Dryden  
 Harris, James, R. D. 2. .... Traverse City  
 Haven, Davis .... Bloomingdale  
 Hawley, A. S. .... Berlin  
 Hawley, L. R., 747 Ry. Exchange Bldg. .... Chicago, Ill.  
 Hebert, Amos A., R. D. 1. .... Caseville  
 Hebert, J. E. .... Peck  
 Hendershott, Floyd .... Parma  
 Hildner, R. G. .... Richville  
 Hill, James B. .... Saginaw  
 Hill, Thomas, 206 Hammond Bldg. .... Detroit  
 Hillman, B. A. .... Metamora  
 Hoards Dairyman. .... Fort Atkinson, Wis.  
 Hoffman, J. B. .... Oakley  
 Hoffman, W. G. .... Ida  
 Hoodemaker, D. A., R. D. 1. .... Salem  
 Horton, H., R. D. 1. .... Mungers  
 Howard, L. C. .... Concord  
 Hubinger, L. .... Frankenmuth  
 Hull, N. P. .... Dimondale  
 Ives, E. W. .... Coopersville



Ives, R. L.	Greenville	Lytle, Geo. W.	Gobleville
Jankoski, Frank S.	Wayland	Marshall Creamery Co.	Marshall
Jenks, Geo. E., 208 Kinzie St.	Chicago, Ill.	Marston, T. F.	Bay City
Jennings, R. E.	Paw Paw	Martin, B. C.	White Cloud
Jenns, Louis H.	Grand Rapids	Martin, Robt. J.	Mulliken
Johnson, Mrs. H. S.	Harrisville	Martin, P. J.	Mulliken
Johnson, Ira O. (Dairyman)	Detroit	McCallum, James	Montgomery
Jones, D. A.	Durand	McCandlish, Frank E.	Goodrich
Jones, Frank L.	Utica, N. Y.	McFate, A. C.	Jackson
Jones, Herbert A.	Himrods, N. Y.	McGill, B. A., 1064 Webster St.	Traverse City
Jordan, C. F., R. D. 3	Mt. Clemens	McKeon, John F. (Thatcher Mfg. Co.)	Detroit
Kaifer, J. P., R. D. 6	Flint	McClland, F. C.	Kellog
Kane, Wm. J., 19 S. Water St.	Phila, Pa.	*McMullen, D. H., R. D. 1 (2 years)	Traverse City
Kayser, Charles, R. D. 19	Reading	MacNeil, F.	Fostoria
Kelley Ice Cream Co., 82 S. Ionia St.	Grand Rapids	McWhinney, H. E.	Grand Rapids
Kempf, Robert, R. D. 3	Fremont	Mead, James, R. D. 2	Grand Ledge
Kendall, W. A.	Coopersville	Meeker, Albert H.	Sparta
Kerr, L. R.	Sandusky	Memhardt, F., N. Y. Despatch Line	Chicago, Ill.
Ketchum, Earl R.	LeRoy	Meppelik, H. J.	Borculo
Ketchum, D. B.	LeRoy	Mersman, John, R. D. 8	Grand Rapids
Ketchum, T. H., R. D. 2	Martin	Mesch, H. C.	Kiel, Wis.
Keyworth, C. H.	Coleman	Meyer, Martin H.	Madison, Wis.
Kimball, Geo. H., Jr., R. D. 5	Pontiac	Michener, E. P. (Miller-Tyson Co.)	Canton, Ohio
Kimball, N. D., 513 Fernwood Ave.	Toledo, Ohio	Mick, L. P.	Elsie
Kinch, Frank	Grindstone	Mills, E. L., 911 Detroit St.	Flint
King, Clyde E.	Concord	Miller, D. T.	Almont
Kloosterman, J. K.	Clarksville	Miller, John C., Jr.	Saginaw
Kolk, Dirk	Fremont	Miller, Floyd C., R. D. 1	Buchanan
Kolk, Henry, R. D. 5	Fremont	Mikesell, Mrs. J. R.	Charlotte
Kneibehler, E. J.	Leslie	Miles, S. R.	Buchanan
Knoll, Milton E.	Decatur	Minor, Glenn C.	Luther
Krause, C. A., Milling Co.	Milwaukee, Wis.	Moore, J. G.	Madison, Wis.
Ladd, James H.	Lansing	Morgan, C. D.	Gobleville
Ladd, John W.	Saginaw	Morris, Joseph	Oakley
Lake, C. S., 611 S. Lafayette St.	Grand Rapids	Mossner, P. C.	Gera
Lake, Ferdinand D., 132 Powell St.	Grand Rapids	Munger, H.	Reese
Lawrence, P. H.	Hickory Corners	Munn, Mrs. John	Plainwell
Lawson, J. A. & Sons	Deerfield	Munn, John	Salem
Lakeside Elgin Butter Co.	Grass Lake	Murphy, Morris, 229 S. Water St.	Chicago, Ill.
Langtry, Geo. J.	Port Huron	Myers, E. B.	New Era
Leach, T. A.	Richmond	Myers, Geo. C., R. D. 4	Shelby
Leavenworth Bros., R. D. 7	Grand Rapids	Myers, Geo.	Reeman
Leavenworth, P. J., R. D. 7	Grand Rapids	Nettland, Thomas	Reed City
Lewis, Chester V., care Lewis-Mears Co.	Boston, Mass.	New York Produce Review	New York, N. Y.
Lewis, Dan	Reese	Nunneley, Arthus S.	Portland
Linton, Chas.	Bloomington	Nyenhuis, Jacob, R. D. 3	Hudsonville
Linn, Geo. R.	Chicago, Ill.	Oliver, Wm. H., R. D. 14	Grand Rapids
Lillie, Chas. P.	Coopersville	Orleans Creamery Assn.	Orleans
Lillie, Colon C.	Coopersville	Orrisson, C. P.	Springport
Lockwood, C. D.	Athens	Osterhouse, Henry, R. D. 5	Freemont
Long, P. D.	Grand Rapids	Overton, Glen	Burnips Corners
Love, James S.	Pewamo	Owen, Birt, 8 Clinton St.	Grand Rapids
Luttenbacher, Clare P.	Wooster	Pahl, Wm.	Hemlock
Lyon, J. D.	Buchanan	Parker, Fred E.	Lansing
Lyon, O. J.	Waterville, Ohio	Park, John M., R. D. 5	Coopersville
		Parks, W. L.	Benton Harbor
		Partch, C. M.	Armada

Peters, Geo. C.	Chapin	Small, Alfred, R. D. 36.	Camden
Peterson, Bert G.	Clarks Lake	Smith, C. J. W., 340 Commonwealth Ave.	Detroit
Phillips, Jacob	Lamont	Smith, E. A., 426 Larch St.	Lansing
Phillips, J. F.	Fenton	Smith, Edwin K., Box 141.	Hart
Pierce, Archie R.	Scotts	Smith, Edwin H., R. D. 1.	Salem
Pierce, C. B., R. D. 2.	Grand Rapids	Smith, Geo. T., R. D. 31.	Portland
Peirson, S. H.	Goodrich	Smith, Harold C., care J. B. Ford Co.	Wyandotte
Potter, Clark	Three Rivers	Smith, Harry M.	Highland Park
Power, J. F.	Quincy	Smith, J. F., R. D. 5.	Lansing
Powell, Martin	Plymouth	Snay, Ora E., R. D. 1.	Hudsonville
Preston, Geo. W.	Ypsilanti	Soop, M. P.	Belleville
Probert, H. F., Box 14.	Jackson	Sortor, Robert G.	Henderson
Pullen, Geo. J.	Leslie	Southworth, Mrs. N.	Vicksburg
Rabe, H. J., R. D. 1.	Montague	Sowles, Geo. W.	Hesperia
Rabild, Helmer	Alma	Steckle, A. D.	Freeport
Rager, Simon, R. D. 1.	Montague	Stephens, L. H., Jr., care A. Booth & Co.	Detroit
Randall, A. M.	Vestaburg	Sterling, J. C.	Monroe
Ranchholz, John C.	Hemlock	Stevenson, J. W., 1074 Jackson Blvd.	Chicago, Ill.
Raven, W. F., R. D. 3.	Brooklyn	Strating, John	Grant
Ravenna Creamery Co.	Ravenna	Streur, Ed.	Holland
Red Star Creamery, R. D. 7.	Marlette	Stroud, H. H.	Hopkins
Reed, Wm. W.	Perry	Stroh, Clyde H.	Union City
Reeves, Geo. W., R. D. 2.	Grand Rapids	St. John, A. F. (Worcester Salt)	Columbus, Ohio
Reichle, C. J.	Camden	Stewart, Shipley (Handy Wagon Co.)	Saginaw
Remmlington, E. W.	Bloomington	Sudendorf, E., 154 Lake St.	Chicago, Ill.
Remus Co-operative Assn.	Remus	Sunderlin, Ray, R. D. 1.	Lake View
Renbarger, C. E.	Niles	Sunday, Geo. P.	Constantine
Renbarger, W. H.	Glendora	Taylor, Daniel, 108 Best Ave.	Chicago, Ill.
Reynolds, H. T.	Lucas	Taylor, Mrs. H. C., R. D. 65.	Grandville
Richards, Chas. T.	Plainwell	Taylor, H. E.	Tekonsha
Richards, D. W.	Flint	Taylor, W. F., R. D. 5.	Shelby
Riker, Perl G.	Quincy	Tanner, F. C.	Bloomington
Rindge, Lester J.	Grand Rapids	Timmerman, H. C., 23 Robinson Ave.	Grand Rapids
Robbins, D. L.	Port Huron	Thompson, Glenn A.	Grand Rapids
Robison, Floyd W.	Lansing	Thompson, W. W.	Grand Blanc
Rohrer, J. Martin	Grass Lake	Tomlinson, Wm. L.	New Baltimore
Rosenberger, S. S.	Brown City	Truax, Earnest L.	Middleville
Ross, John E.	Brown City	Truax, Olin	Wayland
Rozema, Henry	Fremont	True, Geo. A.	Armada
Rudd, Chas. W. & Son.	Detroit	Urban, John P., 403 E. John St.	Bay City
Rudell Creamery	Grand Rapids	Vandenboom, F. H.	Marquette
Rudell Creamery	Cedar Springs	Vassold Bros.	Midland
Ruff, J. F., 325 Court St.	Port Huron	Vassold, Oscar	Freeland
Sager, A. J., R. D. 25.	Climax	Van Zoren, Marinus, R. D. 3.	Zeeland
Sanborn, L. S., 106 Canal St.	Grand Rapids	Vickstrom, Chas.	White Cloud
Schmidt, Fred	Hanover	Visscher, Engbert, R. D. 3.	Freemont
Schopbach, G. W.	Dowagiac	Vivian, Andrew	Monroe
Schont, John, R. D. 1.	Zeeland	Vugteveen, John	Graafschap
Schreur, John	Fremont	Walte, L. C.	Coldwater
Schwanbeck, E.	Breckenridge	Walker, Hugh M.	Benton Harbor
Seabert, Henry J.	Allendale	Walter, Clarence	Remus
Seekman, Mrs. Benj., R. D. 5.	Coopersville	Warren, E. J., R. D. 1.	Battle Creek
Seelye, L. E., R. D. 5.	Lapeer		
Siebert, A. C.	Nashville		
Sieblink, Bert	Holland		
Sigafoose, L. R.	Montgomery		
Shaw, Frank W.	Goodrich		
Shiel, D. W.	Hillsdale		
Shilling, S. B., 154 Lake St.	Chicago, Ill.		

Warner, Richard, Jr.....	Grand Rapids	Wigent, F., R. D. 36.....	Camden
Waterbury, I. R., care Mich. Farmer		Willard, M. W., R. D. 2..	Grand Rapids
.....	Detroit	Wilson, Caleb J.....	Bauer
Wattles, H. B.....	Troy	Wilson, W. H.....	Albion
Webb, C. R.....	Chesaning	Winter, Edward .....	Port Huron
Westra, Abel .....	Freemont	Wolfe, Aspah G., R. D. 1.....	Pompeli
Wever, John, R. D. 3.....	Zeeland	Yetter, Geo. T., R. D. 2.....	Eau Claire
Whitney, N. J.....	Kalamazoo	Young, Geo. E.....	Barnum, Minn.
Wiard, S. A.....	Ypsilanti	Young, L. A.....	South Boardman
Wiedman, R. ....	Henderson	Zeeland Cheese Co. ....	Zeeland

Total members ..... 404

\* Paid two years ..... 2

1 card from J. B. Hill, no name..... 1

Total annual memberships received..... 407

## AUXILIARY MEMBERS

## TRAVERSE CITY DAIRYMEN'S ASSOCIATION.

## PRESIDENT.

William F. Grant ..... Traverse City

## VICE PRESIDENTS.

Frank Leshner .....	Mancelona	Claus Vohn Glohn .....	Suttons Bay
C. L. Whitney .....	Traverse City	G. O. Ladd .....	Old Mission
D. M. Blodgett .....	Williamsburg	F. G. Lours .....	Elk Rapids

## SECRETARY-TREASURER.

James Harris ..... Traverse City

## MEMBERS.

Barney, Robert, R. D. 3..	Traverse City	McCool, Wm. A. ....	Traverse City
Black, Ed., R. D. 4.....	Traverse City	McMullen, Dan, R. D. 1...	Traverse City
Blodgett, D. M.....	Williamsburg	McMullen, Ed., R. D. 1...	Traverse City
Bragdon, Earnest, R. D. 1.....		Priday, C. H., R. D. 7....	Traverse City
.....	Traverse City	Ransom, E. L., R. D.....	Traverse City
Borsch, Adolph, R. D. 1..	Traverse City	Ransom, Mrs. F. D., R. D. 2.....	
Buell, Clark, R. D. 2....	Traverse City	.....	Traverse City
Buell, Judd, R. D. 6.....	Traverse City	Robertson, Geo., R. D. 6..	Traverse City
Core, Julius, R. D. 5....	Traverse City	Roush, Dave, R. D. 4....	Traverse City
Cressy, Mr. ....	Traverse City	Satdleden, Geo., R. D. 3..	Traverse City
Goodman, John, R. D. 3..	Traverse City	Smith, C. J. ....	Traverse City
Grant, Wm., R. D. 2....	Traverse City	Thacker, Quincy .....	Traverse City
Gray, A. P., R. D. 1.....	Traverse City	Umlor, Wm. H. ....	Traverse City
Ladd, E. O.....	Old Mission	Vohn Glohn, Claus.....	Suttons Bay
Leshner, Frank .....	Mancelona	Whitney, C. L.....	Traverse City
Loucks, Bruce, R. D. 4....	Traverse City	Zimmerman, J. W.....	Traverse City

## ACT 263, PUBLIC ACTS 1909.

AN ACT to authorize the Michigan Dairymen's Association to hold an annual meeting and such auxiliary meetings as may be determined by the association, and making an appropriation therefor.

*The People of the State of Michigan enact:*

SECTION 1. The Michigan Dairymen's Association is hereby authorized to hold one annual meeting and as many auxiliary meetings each year, and at such place or places, as may be decided upon by said association, for the dissemination of knowledge pertaining to dairying and dairy products among the people of the State, and said association shall formulate such rules and regulations as it may deem proper to carry on the work contemplated in this act, and it may employ an agent or agents to perform the duties in connection therewith as it may deem best.

SEC. 2. For the purposes mentioned in the preceding section the said Michigan Dairymen's Association may use such sums as it shall deem proper, not exceeding three hundred dollars, for the necessary current expenses of the Michigan Dairymen's Association each year. All of which the State Treasurer shall pay to the said association on the warrants of the Auditor General from time to time as its vouchers for the same shall be exhibited and approved.

SEC. 3. The Auditor General shall incorporate in the State tax for the year nineteen hundred nine the sum of three hundred dollars, and for the year nineteen hundred ten, the sum of three hundred dollars, which amounts, when collected, shall be credited to the general fund to reimburse the same for the moneys hereby appropriated.

This act is ordered to take immediate effect.

PATRICK H. KELLEY,  
President of the Senate.  
COLON H. CAMPBELL,  
Speaker of the House of Representatives.

Approved

FRED M. WARNER,  
Governor.



---

---

PROCEEDINGS OF THE  
TWENTY-FIFTH ANNUAL CONVENTION  
OF THE  
MICHIGAN DAIRYMEN'S ASSOCIATION  
HELD AT  
GRAND RAPIDS, MICHIGAN, FEB'Y 17, 18, 19, 1909.

---

---

THE UNIVERSITY OF CHICAGO PRESS

CHICAGO, ILLINOIS

THE UNIVERSITY OF CHICAGO PRESS

THE UNIVERSITY OF CHICAGO PRESS

THE UNIVERSITY OF CHICAGO PRESS

THE UNIVERSITY OF CHICAGO PRESS



The twenty-fifth annual meeting of the Michigan Dairymen's Association was opened at Grand Rapids, in the Press Building, February 17, 1909, at 10 o'clock A. M., with President Colon C. Lillie in the chair, and after instrumental music by Misses Wilson and Magill, of Flint, invocation was offered by Mr. Field, physical instructor of the Y. M. C. A., Grand Rapids.

### PRAYER.

MR. FIELD, GRAND RAPIDS, MICH.

Let us join in prayer. Our Heavenly Father, we ask in all humbleness Thy great blessings upon us and this meeting to be held here today. We ask Thy special blessings upon the officers of this association. We ask Thy blessings upon the men that are here, and may the actions taken here today be taken in the spirit of trust. We ask it in the name of Jesus, Amen.

---

The Chairman: The Association is fortunate this morning in having the right man to deliver to us the address of welcome. Mr. Stowe, as many of you remember, was the first secretary of this organization, and was very influential in bringing about the organization of the Michigan Dairymen's Association. You will remember, too, a few years ago that he was instrumental in entertaining the dairymen in Grand Rapids, and it is quite fitting and proper that he should be chosen to give this address of welcome. I take great pleasure in introducing to you Mr. E. A. Stowe. President of the Grand Rapids Board of Trade.

### ADDRESS OF WELCOME.

MR. E. A. STOWE, GRAND RAPIDS.

Mr. President, Ladies and Gentlemen:

I have always thought Mr. Lillie was up to date, but when he introduces me as president of the Board of Trade he is a little behind the times. My successor was elected and installed two weeks ago last night.

It is with the utmost sincerity that I assure you I esteem my present opportunity as one of the greatest honors that have come to me.

I feel that I am standing before a robust, healthy, public spirited and most influential factor in the welfare of Michigan, a body whose existence is in a measure due to an initiative taken by myself just twenty-four years ago; so that the emotions I experience have the tenderness, the pride and the confidence of a foster father who greets the child who has gone far toward a realization of a parent's best hopes.

Just twenty-four years ago I issued the first call for a meeting for the purpose of organizing a Michigan Dairymen's Association. The call proved timely and was heeded, and this Association, fully organized, bestowed upon me the first real distinction awarded to me by electing me to act as secretary.

You gentlemen and ladies now within sound of my voice, as I extend to you most cordial expressions of welcome in behalf of the business men and the citizens in general of Grand Rapids, have but faint appreciation of the satisfaction I experience in performing so delightful a function.

Some wise man once put all of our fears to rest by declaring: "No man or woman ever grows old, but we, every one of us, do grow older."

In 1885—the birth year of this Association—we were all younger and we all had the courage and the hopes of youth. As for myself, I was just beginning to block out a business of my own, and many others present were doing likewise. And all such will recall with affectionate gratitude the wise counsels and loyal earnestness of many with us then who have passed on, masters of the wondrous mystery. They were strong men and noble women who, intense in their devotion to the aims of our organization and absolute in their faith as to the power of progress, also embodied in its best estate all the essentials of civic righteousness.

And together we worked and wrought until, after seven years of service as your secretary, believing that your interests would be better served by a change—and we agreed on that point—I ended my duties as secretary, turning them over with your full consent to the man who during the past seventeen years has so ably, so faithfully and to your profit acted as your secretary, Mr. Samuel J. Wilson.

Never having lost one iota or a single instant my deep interest in the welfare of your organization, I can fancy no duty more honorable or more delightful than the present one—of warmly welcoming you to my own home town, Grand Rapids, the industrial, commercial, educational and social metropolis of Western Michigan.

And I desire to assure you that it is a happy fact that Grand Rapids is able to offer you various object lessons of striking value to dairymen. To begin with, I know of no city in the country where the average dairyman can be less tempted to dilute his milk with water than in Grand Rapids, because primarily we have no water fit to put into milk, and, if we had, we have no city water works adequate for the pumping of such water.

Then, too, Grand Rapids is the birthplace of the Michigan Anti-Tuberculosis Society and was the first city in Michigan to establish an anti-tuberculosis hospital as a municipal institution. And so we have a milk inspector and we have "certified" milk on sale. Let me tell how it worked with a friend of mine recently—illustrating the value of "certi-

fled" milk: This friend was visited by a niece, a young mother, who was nursing a six-months-old babe. The mother became suddenly and seriously ill and her physician advised the substitution of "certified" milk. When asked as to where such milk could be obtained, the physician gave the name of a druggist. Applying to the dispenser of compounds, my friend was received with a supercilious grunt and was advised to apply to the Health Officer, "or," the druggist added, naming a well known creamery, "you can get milk there just as pure and at less than half the price."

My friend did not want to risk the tiny life of his grand-niece and so—about 8 o'clock in the evening it was—he visited the Health Office, to find only a janitor present. This official said, "Call up the Health Officer." My friend did this, to learn that the Health Officer was not at home and to be recommended to call up the Assistant Health Officer. This he did also and ascertained that there was one single dealer who had "certified" milk for sale, and that, so far as the Assistant Health Officer was aware, there was no other place where "certified" milk could be obtained in the city. He learned also that this particular dairy was fully three miles away and that to telephone and give an order and have it delivered by messenger would involve an expense of about 40 cents.

Meanwhile the grand-aunt at home had gotten busy, and bought unknown milk at a nearby dairy where she was well known and the baby thrived, the mother recovered in a few days and the physician, acquiescing with the procedure, had observed: "Well, you see Grand Rapids has not yet gotten this 'certified' milk business down quite fine. But it is a good thing all right, is 'certified' milk."

I presume most of you have seen in the daily papers a portrait of a high browed, commonplace looking chap with a long and drooping moustache, who looks as though after drinking his morning cup of coffee he had permitted the adhering concoction to dry and harden thereon, who says: "Kissing is a disgusting as well as a dangerous vice." This bacteriological bigot is a preacher, I believe, and a New Jersey preacher at that. As I studied this man's picture I could not help muttering to myself, "She wouldn't let him and I don't blame her." And then intuitively almost I added: "Thank God there are no such men in Michigan."

All of these little jolts—if you will kindly bear with me but for a minute longer—do not prove that bacteriology is valueless. We are, all of us, I believe, quite free to admit that the real bacteriologist has achieved wonderful results in the prevention of disease and in the annihilation of threatened epidemics. But all physicians are not expert bacteriologists and few of the really reliable bacteriologists are high grade, practicing physicians. The latter have, as it were, advanced several steps higher, don't have to answer emergency calls, are not required to take long drives in the country or bestow their sympathy, their moral influence and their power of suggestion directly upon the person and individuality of the patient. And so we have in every community almost a score or several well meaning gentlemen who are ordinarily good as physicians or analytic chemists, but who are not bacteriologists; gentlemen who keep fairly well informed as to what ad-

vances are being made in bacteriology and who know in a really thorough way just what it is possible to do in the prevention of disease. Then, too, we have scores of youngsters just out of college and loaded to the limit with microscopy and its multitudinous nomenclature. Thus through a combination of these two classes with the great masses who are so ready to see things, there has been developed a fadism which stands prominently and unblushingly by the side of the real thing—bacteriology.

I believe in the great value of the present anti-tuberculosis movement all over the country, but I believe also that many persons free of the dread disease are driven to a development of the plague through the guesswork suggestion of some one who does not positively know. No sane man will deny the tremendous boon to humanity embodied in Prof. Koch's wondrous discoveries for the prevention of certain diseases; or in the invaluable blessing conferred upon the world at large by Pasteur's revelation as to the prevention of hydrophobia.

And I feel safe to say that there is no group of citizens more free to appreciate the value of such things or more conscientious and thorough in their efforts to observe every well-established principle of hygiene than are the men and women before me—the members of the Michigan Dairymen's Association. You are not only ready to go to any length to carry out to the letter every regulation as to the theory of bacteriology, sanitation or hygiene, but you are sure to demand, "Show me" before you accept every guesswork practice born in the brain of mere enthusiasts or experimenters who do not know beyond question.

Ladies and gentlemen, I thank you and for the people of Grand Rapids en masse I welcome you to our city.

The Chairman: We have chosen to reply to this address of welcome a man who lives in the eastern part of the state, a man who has always taken a great interest in this association and in the dairy industry, a man who is esteemed at home and honored all over the state. I take pleasure in introducing to you Hon. T. F. Marston, of Bay City.

## RESPONSE TO ADDRESS OF WELCOME.

HONORABLE T. F. MARSTON, BAY CITY, MICH.

Mr. Chairman, Ladies and Gentlemen:

I cannot say that it gives me any pleasure to stand before you this morning. I appreciate the honor and I feel sorry, after what Mr. Lillie has said in introducing me, that I must shatter any delusion you may have in regard to myself.

Mr. Stowe, I wish to thank you for your kindly words of welcome and for the welcome you have expressed for the city of Grand Rapids. We appreciate that for many years the Association had but little standing outside of the rural communities. The larger cities gave but little credence to the Association as being a power, or as being in earnest or

of as much benefit and use as it has grown to be. Mr. Stowe should feel proud to think he was one of the organizers of the Association.

This Association has done all kinds of work. It has done a work that is placing it now as one of the strongest and best institutions in the state for the advancement of not only the rural communities but also the people in the cities. We lately have been helped out most wonderfully by the dairy and food department. The two taken in conjunction with the work the government has done, all the associations working for the betterment of dairying in Michigan, have done more in this state, I venture to state, than any other one influence that has been brought to bear in the state for years.

It was my business opportunity a few days ago to be in New York in the dairying section. I talked with many of the dairymen there and as soon as they found I was from Michigan they all said a good word for us as a state advanced in dairying. It is not that we wish to be known as a state in which the volume of business will be large but we wish to be known as a state from which the best of dairy products will come, even down to the breeding end of it. We want the best of dairy cattle. I liked the remarks of the gentleman who preceded me in regard to the tuberculin test and the other things that mean so much to the dairymen and to the Association.

I know I do not misstate the fact when I say this Association is extremely glad to get to Grand Rapids, for I know in the past five or six years that various members have urged the Association to meet at their own respective towns and cities, and yet the boys would get to one side and say "Let's go to Grand Rapids." "We have a better time there." "They make us welcome." That is the reputation this city has. The political meetings and other meetings show that almost every one who has had the pleasure of attending a meeting in Grand Rapids is glad to come back again.

Mr. Stowe, we are glad to thank the citizens again. We appreciate the room you have given us in which to have these meetings, we appreciate the room you have given us for our exhibits, and we appreciate the welcome that has been tendered us. I thank you.

The Chairman: I will at this time ask the Vice-president to take the chair.

Vice-president Bechtel takes the chair.

The Chairman: The next on the program is the address by our president, Mr. Colon C. Lillie.

Members of Michigan Dairymen's Association, Ladies and Gentlemen:

I take great pleasure in greeting you here today on the occasion of the 25th annual Convention of our Association.

The past year has been with all a fairly prosperous one for the industry, although not as prosperous as the price of butter and cheese would seem to indicate, because the cost of production—the price of feed, labor, and of living for the dairy farmer—has increased quite in proportion to the price of dairy products. Many think the cost of

production has increased more in proportion than the price of dairy products. In this respect the producer of butter and cheese has fared better than the producer of market milk. For some reason not readily given, the price of market milk has not advanced in proportion to other dairy products, and in a majority of instances the milk man is receiving the same old price for his product that he did when feed, labor and the cost of living were less.

In our business, like all other kinds of business, some are making a good profit and some are making almost no profit at all. It is estimated that the total value of all dairy products in the United States for the past year is over \$800,000,000, and it is safe to say that the cost of producing this vast amount of dairy products was entirely too much. On the average the dairyman doesn't get the profit he should. And it is the object of this Association to discuss ways and means of bringing about greater prosperity for the dairy farmer.

The dairy industry may be divided into three great divisions:

- 1st. The production of the raw material—milk—or dairy farming.
- 2nd. Manufacturing this raw material into the finished product—butter or cheese—or preparing it for direct consumption.
- 3rd. The selling of the various products.

Our greatest opportunity lies with the producer. Here is where our help is most needed; and by helping the producer we help the manufacturer and the commission man. I assume that both the manufacturer and the commission man are making a fair profit now, and in fact, practically all the profit they can make; unless they can assist in helping the producer to make greater profit, thereby stimulating him to increased production. The fundamental principle of our Association is that no division of the dairy industry can prosper permanently unless all divisions do. Some states have separate Associations for members of the different divisions and seem to think that their interests are separate; but we believe that the interests of all the divisions are mutual and can best be subserved by working hand in hand for the development of the entire industry. This is why we have congregated here this week. Dairy farmers, buttermakers and cheese makers and manufacturers, and commission men, our interests are common and we want the most cordial relations to exist between the members representing the different phases of the industry.

#### DAIRY FARMING.

Dairy farming is a broad, complicated and interesting subject. I can only touch upon it in a general way.

By a better understanding of soils, fertility, rotation of crops and farm management the average dairy farmer can produce crops for one-third less money than he now does.

By proper combination of these foods and more careful and liberal feeding and proper care, the average dairy farmer can produce milk or butter fat for one-quarter less money than he does today.

By proper selection and intelligent breeding, the average dairy farmer can double the average annual production of his cows. The average annual production for the cows of the state is said to be around 140 pounds of butter fat, while there are many herds producing 300 to 400 pounds and more.

## CO-OPERATIVE COW TESTING ASSOCIATIONS.

Co-operative cow testing associations are proving to the dairy farmers that it pays them better to feed the crops which they grow on their farms to their cows than it does to sell these crops off of the farm. The records of some 1,200 cows in four different communities show on the average the farmers received \$1.85 for every \$1.00 worth of feed at market prices fed their cows. This will surely stimulate farmers to do better work, for only men who do well strive to do better. The cow testing associations put dairying on a business basis and cannot help but create interest and enthusiasm in the business.

## AUXILIARY DAIRY MEETINGS.

The auxiliary dairy meetings of this society carry dairy enthusiasm into the very midst of our dairy farmers and are more helpful in improving production, or dairy farming, than our annual meetings. Hence I want to see these meetings kept up and their influence extended.

## IMPROVING THE QUALITY OF DAIRY PRODUCTS.

Improved quality of dairy products means much to every phase of the industry. We are all, as well as the consumer, much interested in clean, wholesome milk, butter and cheese. For quality the dairy farmer is almost entirely responsible. The farmer is blamed for much he ought not to be and I would like to find some one else to lay this question of quality to; but I am unable to do so. It rests upon the farmer's shoulders almost entirely. The foundation for quality is clean milk, and the farmer is alone responsible. If he produces unclean milk, it means poor butter, unwholesome cheese, and sick babies. The farmer is to blame for it and must pay for it because it means lessened consumption and reduced prices, while the cost of manufacturing and selling is not reduced, but rather augmented. If all the milk produced today was clean milk, there would not be enough of it to meet the demand,—people would consume so much more milk, butter and cheese.

When farmers come to realize the importance of clean milk it is a simple matter to produce it. It simply means clean barns, clean cows, clean milkers, clean dairy utensils—that all. Don't let the dirt and filth get into milk and it is clean, and it means much more to the farmer than he seems to realize. Every member of this convention should consider himself, or herself a committee of one to preach the gospel of clean milk.

## MANUFACTURING OF DAIRY PRODUCTS.

The manufacture of dairy products is in a high state of perfection. Science and invention have done much in this department of the dairy industry. The creameries and cheese factories of Michigan are doing on the average, good work. The butter and cheese exhibited at the educational scoring tests show very conclusively that there is a marked improvement in workmanship. The buttermakers and the cheese makers are making good. They cannot make a good article from a poor product, though many of them are manifestly sufficiently skilled to make the

finished product an improvement on the quality of the raw material. I do not wish to say that we have no poor buttermakers, or poor cheesemakers. We have too many of them. Some are still made by "the rule of thumb," but many are earnest, conscientious, up-to-date; studying conditions with an idea to overcome them as far as possible. Most of our factories are in good shape, fairly well managed. Some are not equipped with improved machinery and appliances as well as they should be for best results, but there has been great improvement in this direction of late.

The greatest need of our factories to improve the quality of the output is an improved quality of the milk and cream received. The attention of the factory should be directed to this question, and a campaign begun to improve the quality. The greatest good can be accomplished in the shortest time by grading the cream as it is received and paying for the same according to quality. It takes some moral courage to do this, but it should be done.

Business organization is necessary for this. One factory can accomplish but little alone. But with a good factory organization in a given section, the work can be accomplished not only to the benefit of the manufacturer, but to the great benefit of the producer. Organization is necessary for the benefit of both manufacturer and producers in another direction. Factories are put to great and unnecessary expense in delivering cream because they persist in going into each others territory. Territory should be divided and increased business secured by the encouragement of more intensive dairying. Farmers should be interested in this question because increased cost of delivering is paid for by the farmer in the final analysis. This question should be discussed with patrons and arrangements made that will be satisfactory to all.

#### THE SELLING OF DAIRY PRODUCTS.

In selling the dairy products, the idea should be to get as close to the consumer as possible. Large factories can distribute to retailers direct and save the wholesalers commission. Where the output of a factory is too small to warrant this extra expense, the factories of a given section could co-operate for this purpose, making goods of a uniform quality and distributing through one sales agent. In this way factories could receive more for their product. An organization of factories could hold goods in cold storage just as well as a commission house, and hold their customers the year through.

#### CERTIFIED MILK.

Certified milk should be controlled by law in this state. At the present time any one can sell common, ordinary, market milk for certified milk and there is no one authorized to interfere. We should have a law defining certified milk and placing the sale under the control of the Dairy and Food Commissioner, or some other responsible authority, whose duty it shall be to see to it that the consumer is getting what he pays for.



## ICE CREAM.

Ice cream should also have a standard fixed by law. Much of the product sold under the name of ice cream contains but a small per cent of cream. The National Food and Drug Act fixes the standard at 14 per cent butterfat. Many ice cream manufacturers contend that this is too high. Be that as it may, the consumer and the dairymen should have protection in this product. Frozen skim milk and gelatine, corn starch and eggs does not make ice cream and ought not to be allowed to be sold for that product. We have no particular objection to people buying such a product if they know what it is. But we as dairymen are interested in not allowing the public taste to be educated to believe that our delicious cream when frozen makes that sort of a product.

## OLEOMARGARINE.

Oleomargarine is out for another fight and the dairymen of this land and the consumers should join hands in this fight and see that it results in another defeat for the oleo combination. There has lately been introduced into the National Congress a bill which has for its purpose to destroy the effect of the Grout law. The oleo interests, of course, are back of it and they hope to win by creating a sentiment among business men and consumers favorable to their interests. They call the Grout law the "farmers law" and claim that it was passed solely for the benefit of farmers and dairymen. This is a misrepresentation. It was passed more for the benefit of the consumers than for the farmers. Farmers are benefited only indirectly. The object of most food laws is to prevent deception, to protect the consumer against fraudulent articles of food, and the so-called oleo law is no exception. What right have people to color tallow to resemble butter? Why do they want it to look like butter? Simply to deceive and defraud the purchaser, the consumer. If oleo is as good as butter, why not sell it as it is and take the market away from the dairymen? People say oleo is better than poor butter. I will agree to that, but it does not compare with good butter and never can, and the oleo people realize it. Oleo can be produced cheaper than butter. It is not as good as butter and it should be sold for less money to the consumer than butter; and besides, people are willing to pay more for butter than they are for oleo. The only way that oleo can be sold for butter prices is to deceive the people and make them believe they are buying butter. Hence, the law is primarily to protect the consumer.

But oleo interests claim that if the dairyman is allowed to color butter, the oleo manufacturer has a right to color tallow. That is not reasonable. The dairyman does not color butter to deceive the consumer. He does not claim that it is something else after it is colored. In fact, he does not color butter produced under natural conditions in the summer when the cows have green grass for a food. That butter is colored naturally. The dairyman colors butter made when the cow is fed dry food, simply so all butter will be uniform in color. If the oleo manufacturer wants his product to have a color other than its natural one, why don't he color it green or pink. No, he must take the trade mark of butter, solely for the purpose of deceiving and defrauding

his customers. People are coming to understand these matters better than they used to and in my opinion the campaign of the oleo manufacturers will not accomplish its purpose. People will not now be deceived by paid "Ads." in the cosmopolitan press and trade papers misrepresenting this question. They begin to realize that this law is primarily for the protection of the public and they will not allow Congress to repeal it for if it is done, a body blow will be struck at all pure food legislation. I don't believe personally in taxing colored oleo 10 cents a pound. I would prohibit absolutely the coloring of oleo in imitation of yellow butter. That settles the whole question, protects the consumer, and does justice to the dairy industry.

#### RECOMMENDATIONS.

An Association matter of considerable importance should be decided once for all at this meeting. For a number of years many of the members of this Association have felt that the secretary is not entitled to a salary from the Association and also the money received from advertising in the annual program book. As an association, we haven't sufficient revenue to do the work that we wish to do and should do. Yet the Secretary in addition to a fair and reasonable salary for the work he does, receives annually several hundred dollars additional from the sale of advertising space in the year book. Yet if it was not for his position as secretary of this Association he could not get one dollar of it.

Two years ago at the annual meeting at Saginaw the committee on resolutions offered a resolution granting an increase of salary to the secretary and requesting him to turn the money received from advertising over to the Association as part of its funds. This resolution was passed unanimously. Yet the secretary has never complied with that portion of the resolution pertaining to money received from advertising, although he accepted the increased salary. Now, in my judgment, it should be thoroughly understood by the incoming secretary, whoever he may be, that this money received for advertising belongs to the association and not to the secretary personally, or this resolution should be repealed forthwith.

Our fiscal year ends June 30th of each year. Our financial statement must be for the year beginning July 1st and ending June 30th. It would be better in many ways to have the term of office of the various officers begin and end with the fiscal year. This would give the old secretary the opportunity of completing the records and editing the annual report. We are also in the habit of holding one or more auxiliary meetings in the spring after the annual election of officers which meetings many times have been arranged for by the old officers. It would allow all officers to complete their work before they went out of office. I would therefore recommend that the by-laws specify that the terms of the officers elected at this and future annual meetings shall begin on July 1st following such election and expire on June 30th of the next succeeding year.

In conclusion I wish to express my thanks and appreciation for having been your president for four successive years. I have enjoyed the work very much and I have tried always to work for the best interests

of the association. The time has now come, however, when I feel that it would be well to pass this office to some one of the many able and worthy members of our association who will give of his time and energy sufficiently to carry on the good work and make our association a still greater factor in the further development of our great industry. It takes considerable time and energy to do the work as it ought to be done, and I feel that I have done my duty in this respect and that I have sufficient work in other directions to take all my time. Pass the honors and the work along.

While I no longer desire to be your presiding officer, I do desire to continue to be one of the working members of the society, always willing to do all that I can for the best interests of the Association.

Mr. Raven: Mr. Chairman, I move that the president's address be referred to the executive committee for reference in the recommendations he suggests.

Motion seconded and carried.

Mr. Burns, Grand Rapids: I would like to see that address published so we may have a copy of it. I think every creamery manager would do well to send a copy of the president's address to each individual patron. In it there is food for thought and I would like to see it published in such shape that it can be put in circulation.

Mr. Smith, Hart: I heartily endorse that.

Mr. Lillie takes the chair.

The Chairman: The next on the program is the report of the secretary-treasurer.

## REPORT OF SECRETARY AND TREASURER FROM FEBRUARY 14, 1908, TO FEBRUARY 10, 1909.

To the President and Members of the Association:

At a meeting of the executive committee, held at the Hotel Dresden in Flint, July 15, 1908, there were present:

Colon C. Lillie, President; W. H. Bechtel, Vice-president; W. F. Raven, Henry Rozema, C. R. Webb, Helmer Rabild, Directors; S. J. Wilson, Secretary.

The meeting was called to order by the president.

Mr. F. A. Aldrich, in behalf of the Flint Improvement League, invited the Association to hold the next annual meeting in the city of Flint, guaranteeing for the machinery exhibit the free use of the first floor of the W. A. Patterson's Co's. carriage repository, a new modern building 66 by 132, steam heated and electric lighted, one block from the hotel and two blocks from the opera house, which was offered for the meetings. Mr. Lillie presented a letter from E. A. Stowe, president of the Board of Trade of Grand Rapids, in which was guaranteed an

exhibition room 65 by 125 and a good large room for the meetings. Upon ballot the vote stood Flint 2. Grand Rapids 5. A motion that the next annual meeting be held in Grand Rapids, Feb. 17, 18, 19, 1909, was carried.

A motion by Mr. Rabild, that a committee of three be appointed to recommend changes in the by-laws in relation to local associations belonging to the state Association, was carried. The president appointed a committee consisting of W. H. Bechtel, W. F. Raven, and Helmer Rabild.

A motion, that the election of officers be made a special order for Tuesday, Feb. 18, at 4:00 P. M., was carried.

A motion that the butter and cheese be in the hands of the Association on the Friday before the meeting and that it be scored on or before the Tuesday noon before the convention was carried.

A motion that the nominating committee be dispensed with was carried.

A motion that the president, vice-president and secretary be elected by nomination and ballot in open convention was carried.

Meeting then adjourned.

S. J. WILSON,  
Secretary.

Following is a report of the source and amount of all receipts and the amounts of disbursements, for which I hold duplicate vouchers.

# RECEIPTS—CURRENT EXPENSE ACCOUNT.

Balance in fund, February 14, 1908.....	\$73 10
Received from State Treasurer (annual appropriation).....	500 00
Transferred from Promotion Account .....	141 30
<b>Total .....</b>	<b>\$714 40</b>

# DISBURSEMENTS.

1908.			
Feb. 25.	771.	V. W. Tesch, expenses Battle Creek.....	\$3 99
" 25.	772.	Mary M. Carpenter, expenses Battle Creek..	18 83
" 26.	773.	C. L. Davis, supt., exhibits Battle Creek....	18 41
" 26.	774.	Robert Johnson, expenses Battle Creek.....	16 80
" 26.	775.	J. G. Moore, expenses Battle Creek.....	16 84
" 26.	776.	J. D. Nichols, expenses Battle Creek.....	22 30
" 26.	777.	E. K. Slater, expenses Battle Creek.....	31 50
" 29.	897.	James Button, P. M., stamps.....	10 00
April 16.	902.	Mary M. Carpenter, report Battle Creek....	90 00
May 7.	903.	James Button, P. M., stamps.....	10 00
" 20.	904.	S. J. Wilson, expenses Cass City.....	6 59
" 20.	905.	Mary Carpenter, expenses Cass City.....	7 73
" 20.	906.	W. A. Ellis, expenses Cass City.....	1 45
May 22.	907.	James Button, P. M., stamps.....	4 00
" 23.	908.	Hamaker Printing Co., printing.....	5 35
June 9.	909.	Mary Carpenter, expenses Hesperia.....	15 61
" 27.	912.	Mary Carpenter, report Cass City and Hesperia .....	60 00
July 18.	914.	W. F. Raven, expenses executive committee.	6 84
Aug. 3.	915.	W. H. Bechtel, expenses executive committee	2 40
" 3.	916.	C. R. Webb, expenses executive committee..	1 92
" 10.	917.	Henry Rozema, expenses executive committee	8 58
" 24.	918.	Hamaker Printing Co., printing.....	7 50
Oct. 10.	920.	James Button, stamps for reports.....	62 00
Nov. 18.	921.	James Button, stamps .....	5 00
Jan. 7.	925.	James Button, stamps .....	15 00
" 26.	926.	Mary Carpenter, expenses Tecumseh and Salem .....	24 34
<b>Total .....</b>			<b>\$472 98</b>
<b>Balance in fund .....</b>			<b>241 42</b>
			<b>\$714 40</b>

# SUMMARY OF CURRENT EXPENSE ACCOUNT.

Expenses annual meeting .....	\$218 67
Expenses Cass City meeting.....	45 77
Expenses Hesperia meeting .....	45 61
Expenses Tecumseh and Salem meetings (report not yet in and paid) .....	24 34
Expenses executive committee .....	19 74
Stamps .....	106 00
Printing .....	12 85
<b>Total .....</b>	<b>\$472 98</b>
<b>Balance in fund, February 10, 1909.....</b>	<b>241 42</b>
<b>Total .....</b>	<b>\$714 40</b>

## RECEIPTS—PROMOTION ACCOUNT.

1908.			
Feb.	14.	Balance in fund .....	\$388 48
"	15.	Mutual Supply Co. ....	10 00
"	24.	Arnold Mfg. Co. ....	5 00
"	24.	Colonial Salt Co. ....	12 50
"	24.	Empire Bottle Co. ....	10 00
"	24.	F. O. Foster .....	5 00
"	24.	Iowa Separator Co. ....	5 00
"	24.	Jensen Mfg. Co. ....	20 00
"	24.	Kneeland Mfg. Co. ....	10 00
"	24.	Quaker Oats Co. ....	10 00
"	24.	Riverside Co. ....	5 00
"	24.	Thatcher Mfg. Co. ....	10 00
"	24.	Petit & Reed .....	5 00
"	24.	J. B. Ford Co. ....	12 00
"	24.	Membership fees from Fremont .....	4 00
"	24.	Membership fees from Battle Creek .....	264 00
Mar.	4.	Membership fees from exhibits .....	81 00
"	31.	Membership fees at office .....	10 00
June	29.	Membership fees from Cass City and office .....	14 00
Sept.	30.	Membership fees at office .....	3 00
1909.			
Jan.	12.	Burnap Building and Supply Co. ....	10 00
"	12.	National Creamery Supply Co. ....	40 00
"	29.	Port Huron Salt Co. ....	10 00
"	29.	Sharples Co. ....	20 00
"	29.	Wykes & Co. ....	10 00
"	29.	Diamond Crystal Salt Co. ....	10 00
"	30.	Fitch Cornell & Co. ....	10 00
"	30.	Membership fees at office .....	5 00
Feb.	3.	Coyne Bros. ....	10 00
"	3.	J. B. Ford Co. ....	10 00
"	3.	Wells & Richardson Co. ....	10 00
"	3.	A. H. Barber Creamery Supply Co. ....	20 00
"	3.	Worcester Salt Co. ....	10 00
"	6.	Creamery Package Mfg. Co. ....	23 00
"	6.	Vermont Farm Machine Co. ....	20 00
"	10.	T. F. Marston .....	10 00
"	10.	Peerless Separator Co. ....	10 00
"	10.	Great Western Cereal Co. ....	10 00
"	10.	J. E. Bartlett Co. ....	20 00
Total .....			<u>\$1,151 98</u>

## DISBURSEMENTS—PROMOTION ACCOUNT.

1908.			
Feb.	20.	768. W. J. Coleman, signs .....	\$8 00
"	21.	769. E. R. Buckner, janitor .....	12 00
"	21.	770. Post Tavern, for speakers .....	21 50
			<u>\$41 50</u>

*Premiums.*

Feb.	26.	778.	Jesse W. Cobb .....	\$3 88
"	26.	779.	H. W. Weber .....	3 61
"	26.	780.	L. C. Waite .....	2 77
"	26.	781.	Clyde E. King .....	5 27
"	26.	782.	J. T. Entertine .....	5 27
"	26.	783.	Caleb J. Wilson .....	5 55
"	26.	784.	W. H. Renbarger .....	3 33
"	26.	785.	L. Wehrle .....	4 99
"	26.	786.	Claude A. Grove .....	5 55
"	26.	787.	Wellington Best .....	4 16
"	26.	788.	John Vugteneen .....	4 44
"	26.	789.	Floyd Kelley .....	3 05
"	26.	790.	Charles Marcero .....	1 66
"	26.	791.	Bert Kleinheksel .....	4 16
"	26.	792.	Andrew Vivian .....	4 44
"	26.	793.	Ralph E. Warrick .....	2 22
"	26.	794.	S. R. Miles .....	4 44
"	26.	795.	Geo. T. Yetter .....	3 61
"	26.	796.	C. L. Messick .....	4 44
"	26.	797.	W. H. Bechtel .....	4 99
"	26.	798.	Chas. Linton .....	4 44
"	26.	799.	Verne Olney .....	3 88
"	26.	800.	Batavia Creamery Co. ....	3 33
"	26.	801.	Chas. E. Swartz .....	3 05
"	26.	802.	Plymouth Creamery Co. ....	3 88
"	26.	803.	F. W. Shaw .....	2 77
"	26.	804.	Fred Schmidt .....	4 99
"	26.	805.	Interurban Creamery Co. ....	2 22
"	26.	806.	W. J. Hoffman .....	5 55
"	26.	807.	J. M. Rohrer .....	2 77
"	26.	808.	C. F. Jordan .....	3 33
"	26.	809.	H. J. Meppelink .....	4 99
"	26.	810.	John Schont, Jr. ....	4 44
"	26.	811.	Clyde Stroh .....	6 94
"	26.	812.	Walter Hall .....	5 55
"	26.	813.	O. A. Ellis .....	4 44
"	26.	814.	Jamestown Creamery Co. ....	3 33
"	26.	815.	J. Arink .....	3 33
"	26.	816.	Volkert Barnes .....	3 33
"	26.	817.	Abel Westra .....	2 77
"	26.	818.	Milton E. Knoll .....	1 66
"	26.	819.	Geo. P. Sunday .....	5 83
"	26.	820.	E. B. Myers .....	3 33
"	26.	821.	John H. Faber .....	4 99
"	26.	822.	Benno H. Hillman .....	3 61
"	26.	823.	C. E. Renbarger .....	5 27
"	26.	824.	Windsor Bovee .....	3 33
"	26.	825.	Frank B. Dent .....	3 61
"	26.	826.	B. L. Longfellow .....	1 11
"	26.	827.	T. C. Halpin .....	4 16
"	26.	828.	Asa D. Steckle .....	2 22
"	26.	829.	E. M. Fuller .....	2 77
"	26.	830.	L. E. Seelye .....	3 88
"	26.	831.	J. B. Gilbert .....	4 16
"	26.	832.	E. Demuth .....	3 33
"	26.	833.	Wm. Dubendorf .....	2 22
"	26.	834.	Gera Creamery Co. ....	3 88
"	26.	835.	H. C. Gibbon .....	3 33
"	26.	836.	L. P. Hansen .....	4 72
"	26.	837.	O. J. Lyon .....	3 88
"	26.	838.	G. R. Sortor .....	5 83
"	26.	839.	W. H. Martin .....	4 44

Feb.	26.	840.	Henry Lokker .....	\$4 44
"	26.	841.	Chris Leibum .....	1 11
"	26.	842.	Frank Dickinson .....	3 88
"	26.	843.	D. B. Ketchum .....	2 77
"	26.	844.	Guy A. Bovee .....	1 11
"	26.	845.	J. L. McIlwain .....	2 77
"	26.	846.	John A. McDonald .....	1 66
"	26.	847.	B. F. Hadley .....	2 77
"	26.	848.	Nunneley Bros. ....	2 22
"	26.	849.	Geo. W. Soules .....	4 44
"	26.	850.	Edwin K. Smith .....	1 66
"	26.	851.	Andrew Myers .....	1 11
"	26.	852.	E. F. Brown .....	3 88
"	26.	853.	H. A. Black .....	1 66
"	26.	854.	E. Schwanbeck .....	4 99
"	26.	855.	A. B. Conant .....	3 33
"	26.	856.	C. H. Keyworth .....	1 11
"	26.	857.	R. C. Austin .....	1 11
"	26.	858.	R. J. Powell .....	2 22
"	26.	859.	Mrs. Wm. Southworth .....	2 22
"	26.	860.	Mrs. J. R. Mikesell .....	4 44
"	26.	861.	Mrs. J. H. Munn .....	3 33
"	26.	862.	A. J. Riley .....	1 11
"	26.	863.	Geo. Hunsberger .....	2 22
"	26.	864.	R. D. Miller .....	1 11
"	26.	865.	Gilbert Harris .....	1 11
"	26.	866.	John Mersman .....	4 44
"	26.	867.	Mrs. James Harris .....	3 33
"	26.	868.	Geo. T. Yetter .....	5 00
"	26.	869.	W. H. Renbarger .....	3 00
"	26.	870.	J. T. Entertine .....	2 00
"	26.	871.	D. W. Richards .....	4 44
"	26.	872.	C. Schreiner .....	3 33
"	26.	873.	H. E. Taylor .....	4 44
"	26.	874.	L. R. Sigafoose .....	3 33
"	26.	875.	Novi Cheese Factory .....	6 10
"	26.	876.	Springbrook Cheese Factory .....	6 10
"	26.	877.	Lilvonia Cheese Factory .....	5 55
"	26.	878.	Powers Cheese Factory .....	6 66
"	26.	879.	Farmington Cheese Factory .....	7 21
"	26.	880.	Franklin Cheese Factory .....	4 99
"	26.	881.	Frankentrost Cheese Co. ....	6 66
"	26.	882.	D. W. Richards .....	4 99
"	26.	883.	C. L. Davis .....	5 55
"	26.	884.	H. E. Taylor .....	5 55
"	26.	885.	D. S. Lickly .....	5 55
"	26.	886.	Perry Cheese Factory .....	5 55
"	26.	887.	Fenton Cheese Factory .....	6 66
"	26.	888.	Byron Cheese Factory .....	7 21
"	26.	889.	D. W. Richards .....	6 10
"	26.	890.	H. F. Probert .....	3 00
"	26.	891.	J. A. Lawson .....	5 00
"	26.	892.	H. B. Wattles .....	2 00
"	26.	893.	G. E. Lockwood .....	2 00
"	26.	894.	H. F. Probert .....	5 00
"	26.	895.	G. S. Elliot .....	3 00

Total ..... \$450 24



Feb. 28.	896.	S. J. Wilson, salary for February.....	\$15 80	
Mar. 20.	898.	V. W. Tesch, lettering diplomas.....	9 15	
" 31.	899.	S. J. Wilson, salary for March.....	17 00	
" 31.	900.	S. J. Wilson, office expenses.....	3 42	
April 2.	901.	Hamaker Printing Co., printing.....	4 95	
June 9.	910.	Hesperia Union, programs auxiliary meeting.	2 70	
" 23.	911.	S. J. Wilson, salary April, May and June...	50 00	
" 30.	913.	S. J. Wilson, office expenses.....	75	
" 30.		Transferred to Current Expense Account....	141 30	
Sept. 19.	919.	S. J. Wilson, salary July, August and Sept..	50 00	
" 21.	923.	Hamaker Printing Co., printing.....	3 60	
" 21.	923.	Hamaker Printing Co., printing.....	3 60	
" 21.	924.	S. J. Wilson, salary Oct., Nov., and Dec....	50 00	
Feb. 6.	927.	Hamaker Printing Co., printing.....	16 50	
" 6.	928.	S. J. Wilson, salary for January.....	17 20	
" 8.	929.	S. J. Wilson, office expenses.....	3 30	
				<u>\$391 82</u>
				<u><u>\$883 56</u></u>

## SUMMARY OF EXPENSES—PROMOTION ACCOUNT.

Premiums on exhibits .....	\$450 24	
Expenses 1908 annual meeting .....	41 50	
Secretary's salary for one year .....	200 00	
Lettering diplomas .....	9 15	
Office expenses .....	7 47	
Printing .....	27 75	
Expenses to date 1909 annual meeting.....	6 15	
Transferred to Current Expense Account .....	141 30	
Total .....		\$883 56
Total receipts, Current Expense Account.....	\$714 40	
Total receipts, Promotion Account .....	1,151 98	
Total receipts, both funds .....		1,866 38
Total disbursements, Current Expense Account .....	\$472 98	
Total disbursements, Promotion Account .....	883 56	
Total disbursements, both funds .....		1,356 54
Balance both funds, February 10, 1909.....		<u><u>\$509 84</u></u>

It gives me great pleasure to submit this report to the consideration of the members, since the finances of the association are in a most gratifying condition. The bank balance is the largest in its history and there is \$252.00 still due on space.

Referring to the matter that Mr. Lillie spoke of I want to say that I have my view of that case as well as he, and that is probably where we disagree. I have the original resolution at the hotel. If I had thought the matter was coming up here I should have brought it with me, but it is published in the 1908 report of which I have a copy here. I will read it and see if it reads as it is reported to. I find that I have not the book with me but I will bring the original resolution to the convention. There is not a thing in it in relation to the publication of this little booklet, or advertisements, not a single thing. I

was given the privilege of publishing that little booklet by the Association at a time when the secretary practically had to carry the expenses of the Association from one end of the year to the other. At our annual meetings, if we got out of town without taking up a collection from the members to meet a deficiency we considered ourselves fortunate.

At Saginaw there was a resolution adopted that it now appears was aimed to take this away but the man that wrote that resolution did not know enough to write it in an effective manner. I understand that he and some of his friends have been accusing me of changing the wording before publishing the same.

I want to say to you that there were no changes or alterations made in the resolution as the President in his address would lead you to believe, but it was published in the exact form and wording in which it was written and adopted at Saginaw.

It has been my policy to avoid all controversy or words of feeling in our meetings and I have always tried to keep the best of feeling between all our members, but the time has come when I do not propose to submit quietly to the accusations that have been made against me or to being stabbed in the back by any one man. Either the President or I are telling you the truth and I am glad to be able to prove to you that I am the one that is telling you the truth.

(The original resolutions were produced to the members of the committee, upon whose recommendation they had been adopted, who examined them and declared them to be the original resolutions as offered by them to the convention at Saginaw in 1907, without alterations or erasures and they acknowledged to Mr. Wilson that they were glad that he was able to disprove the charges that had been made against him.) Members may find these resolutions on page 169 of the 1907 report.

If I should be re-elected secretary this year it would give me more pride than ever before and I should consider it as an entire vindication of my acts and of the accusations that have been made against me. If elected I will assist the executive committee in formulating some plan whereby the expenses for the publication of the book can be paid for without the secretary being obliged to put up the money before he gets anything back out of it so the book in the future will be published by and for the Association.

Mr. Raven: I move that the report of the secretary be referred to the board of directors for auditing.

Motion seconded and carried.

The Secretary: I might say that whenever the board of directors are ready, they can meet in my room, I have the papers all there for their examination. They can meet me at any time they wish so it will not disturb the work of the convention.

Mr. Raven: As chairman of the board of directors, I wish to announce there will be a meeting of the board of directors at 4 o'clock this afternoon in Mr. Wilson's room at the Livingstone Hotel.

The Chairman: Is there anything further to come before the meeting at this time?

Mr. Raven: There is a committee to appoint on by-laws and constitution.

The Secretary: I notice the program announces that for a different hour. Would it be wise to change that? I am not objecting to it at all but as long as it has been announced that that appointment is to take place at a certain time, would it be wise to change the program?

The Chairman: I think it will be perfectly proper to move that that committee report tomorrow instead of Friday afternoon. That will advertise it so everybody can be present. I do not think it wise to adopt the report of that committee without having the fact well understood but I think it will be proper to move that we have the report of that committee say tomorrow or this evening. I think it would be better than to discuss it now. What do you think of that, Mr. Rabild?

Mr. Rabild: I move that the committee on by-laws report this evening.

Motion seconded and carried.

The Chairman: We will call for the report of the committee on by-laws at this evenings' session.

Is there anything further to come before the meeting? If not, we will stand adjourned until one o'clock this afternoon.

---

### WEDNESDAY AFTERNOON SESSION.

Meeting called to order at 1:45 o'clock by President Lillie.

The Chairman: The ladies who were to furnish us with music do not seem to be present so we will have to dispense with it for the present, perhaps we will have it later.

I am sorry there are not more cheese men here this afternoon. Of course in having a three days meeting we have to bring some phase of the dairy work first, and we have always had the cheese meeting first day. We really have a most excellent program and there ought to be more cheese men present to get the benefit of it. We have with us this afternoon, Mr. U. S. Baer, Secretary of the Wisconsin Cheese Makers Association and Assistant Dairy and Food Commissioner, a man that has had life long experience in the manufacture of cheese, and a man well qualified to talk to you on the subject. I have the pleasure, Gentlemen, of presenting to you Mr. Baer.

### SIDE LIGHTS ON CHEESE MAKING.

MR. U. S. BAER, ASST. DAIRY AND FOOD COM'R., MADISON, WIS.

Mr. President, Members of the Michigan Dairymen's Association, Ladies and Gentlemen:

I am glad to be with you and I am glad to bring to you the good tidings and greetings from the Wisconsin Cheesemakers' Ass'n., the largest of its kind in the world (we never fail to put that on when

we are talking of the Cheesemakers' Association of Wisconsin) and also the greetings from my chief and other members of the Dairy & Food Commission. I am glad I am here for another reason, that is because I was able to hear the paper of your worthy president and the suggestion that that ought to be published in pamphlet form, to be placed before every creamery and cheese factory patron in the state, I believe was a first class idea. There was a lot of meat in that, all in the shell, and it would be fine to put it before the patrons not only of this state but of the United States.

We hear a good deal of you people. We have heard of your celery fields and of your washing powder and we all know about those peaches that grow over here in Michigan. I am going to use fifteen or twenty minutes of your time. In presenting this paper I am not unmindful of the fact that you people have a market requiring a cheese of a little different character from that which I am going to describe in this paper and briefly give some instructions as to how to produce it, but you have in this session one of your own makers on the program to tell you how to produce that cheese, so if my instructions do not apply to your particular make, I know it will in some localities in Michigan because I have had to do with some Michigan cheese in experimental work while connected with the U. S. Government and I got some cheese to carry out some experiments I am going to describe here.

There are good and essential reasons why cheesemaking must always remain a prominent factor in your state. The product of the cheese factory is a finished product. It represents the embodiment of highly skilled labor. It goes to market in a concentrated form. The manufacturer of cheese, no matter how intensive a system of agriculture is pursued, leaves the farm no poorer in natural wealth and fertility. As you advance in cheese making, as you improve your dairy products, your cows, and your methods, you extend the market for your cheese. You have not reached the point of over production. The demand continues to be largely in excess of the supply.

As great as has been the growth of manufacture, mining, trade, and transportation in Michigan, all of which tend to draw population from dairying, it is gratifying to note that of all the several diversified interests of industry and agriculture, none have prospered or afforded you more substantial returns than the cheese business during the past few years.

Cheese of different varieties have their origin because of the surroundings in which they originated. For instance, in the low, flat meadows of Holland the Limburger cheese had its birth, and when they came to make Limburger and Brick cheese in America, they found the same kind of locations especially fitted for the production of these cheeses, abundance of rich grass, plenty of water, the same as in Holland.

Take it on the other hand, the Swiss cheese is a product of a higher elevation; it became what it is because of its circumstances and surroundings. Among those high mountains of Switzerland, no highways, no railroads, it became a necessity, in order to dispose of the milk product, to make it into a kind of cheese that would bear transportation, have long keeping qualities, keep for years in good condition. When they came to transfer that industry into America, they found the same surroundings that are not so well fitted for general farming; where the

fields are not cultivated or plowed at all; where the hillsides are so steep that the soil will wash away, and where there is plenty of rock near the surface, especially limestone rock, and where good springs of water abound to be particularly favorable to the production of fancy Swiss cheese.

The state of Michigan is not only fitted for the production of one kind of cheese, but from its variety of soil and differences in elevation, it affords great opportunities for making a number of varieties, and in consequence of those advantages they may be made of a good quality.

It is a good thing for people to devote themselves to the manufacture of the kind of cheese that their natural conditions and their experience favor.

Our people until quite recently have known but little of the great variety of soft cheeses common in the European markets. The local markets have been to a great extent monopolized by hard cheeses, principally of the type of American Cheddar. Within the past few years a brisk demand for soft cheese has been developed here at home. This may be attributed partly to the tastes acquired by our people who have traveled abroad, to our increasing foreign population, and to the desire of people of European birth for the types of cheese familiar to them at home, as well as to a growing demand and appetite among others who have tried the foreign delicacies.

The soft cheeses with their strong characteristic flavors, give relish to the coarser and less flavored foods and owe their chief popularity to their varied and respective flavors.

The so-called fancy cheese has come in response to a demand for variety from those who use cheese. Most all of our people are now eating cheese, but all no not like to use the same kind in the same form for a long time. If nothing else is offered, a difference in the shape or style of the cheese will satisfy the longing or craving for variety. People no more care to eat cheese of the same kind and in the same form for a long time than they care to eat one kind of meat or desert all the time.

There are many acts and branches of science which are intricate and very difficult to master. If there is one more difficult than another, the manufacture of cheese seems to excell. When we consider the effect of fermentation and bacterial influences, the unknown conditions of milk as received at the factories, the hidden power of rennet action and the intricate combinations which any or all of these form to effect the final result, any attempt to fully describe and attach the proper importance to all the facts and principles which underlie cheesemaking is an undertaking beyond the knowledge and experience of the author of this paper.

I shall, therefore, describe an ideal American Cheddar cheese for the home or domestic market and then proceed to describe briefly how it can best be produced.

The recognized, peculiar and varied tastes of cheese consumers call for many different characters of cheese; but the cheese that commands the highest price in the markets of today is one of a clean, nutty flavor, flinty and close in texture, with a firm, meaty, solid, rich and buttery body. Cheese of such a character will keep a long time in prime condi-

tion, and if cured under the most favorable temperatures will improve in quality up to twelve or more months.

Fancy cheese cannot be made from filthy sour milk. In the handling of pure, sweet milk, the whole mass collected in the vat is gradually warmed up to 86°F., when the milk is tested (by means of either the rennet test or the acidimeter) for ripeness, and if sufficiently matured, the color and rennet is added at once. If the milk is insufficiently matured from one to two per cent starter (Commercial pasturized) is then added, and the milk allowed to stand at this temperature until a sufficient amount of acid has developed so that the curds will show one eighth of an inch of acid when applied to the hot iron or .20 per cent acid by the acidimeter, within two hours from the time of adding the rennet at which time the whey should be removed.

None other than harmless or vegetable color should be used and when used should be thoroughly incorporated with the milk before the addition of the rennet. The rennet should be added in sufficient quantities to cause the milk to coagulate ready for the knife in from twenty to twenty-five minutes. The rennet should be diluted with about fifty times its own bulk of cold water and added to the milk in such a way that the coagulation will be uniform throughout the whole mass.

When the curd breakes clean across the finger and is sufficiently firm to stand up before the knife, it is ready for cutting. Great care should be taken to secure an "even cut" so that the curd particles will be uniform in size. Every piece of curd in the vat should be warmed alike. The center of each piece should be just as warm as the outside. As curd is a poor conductor of heat, this condition can be secured only by raising the heat slowly and steadily. The effect of heating rapidly is to cook the outside of the larger pieces of curd faster than the inside. This contracts the surfaces and confines the whey in the center. It would be preferable, if possible, to heat the inside of the cubes the faster, driving the whey to the surfaces; we do not want to do either. We want an even, uniform cook.

One of the most important steps in the process of cheesemaking is to know when a curd is properly cooked or firmed. The real condition can hardly be described in words, but the cheesemaker must learn to recognize it by experience. This is a part of the cheesemaker's art. The curd should not be salvy and soft, but springy and elastic. The most convenient and sure test is to take up a large double handful of the curd and compress it dry of whey. After a minute remove the pressure. If it falls apart readily and the particles resume their former shape and size, it is very good evidence that the curd has been properly firmed.

We should then have one-eighth of an inch acid on the curd (or .20 per cent acidity as shown by the acidimeter) and draw the whey. When the whey is allowed to remain too long with the curd, excess acid is developed, and a dry, mealy cheese is the result. There will also be a great loss of fat. If the whey is drawn too early, a soft mushy article will be produced. The necessity of diligence and care in this branch of cheesemaking is of vital importance in order that the separation of whey may be the most perfect possible.

From thirty-five to forty-five minutes time should be consumed in raising the temperature to 98 or 100° F., as the case may be. To assist the curd in heating evenly and keep it from matting together, it should

be stirred from the time it is cut until the heat is shut off. The automatic curd agitators now on the market are preferable to the hand rake commonly in use.

When the required amount of acid has developed in the curd, the whey is drawn, and the curd dipped upon racks where it is left to drain and mat, having uniform depth of about five inches. If the curd has been properly firmed in the whey, it will not require any stirring at the time of the racking, for this means an additional loss of fat and solids. As soon as the mass is matted sufficiently so as to admit of its being turned over without crumbling, it should be cut into blocks of sufficient size for handling and turn it over, repeating the process every few minutes, always with a view to perfect drainage. The best textured, close, firm bodied cheese, is that made from curd that has been piled but very little, or not at all. If curd is piled, it is important that the outside pieces be folded into the center of the pile each time to insure an even color and uniform temperature of from 96 to 98° F., throughout the mass. When the curd is sufficiently ripened or matured for milling, it becomes stringy or meaty, and when pulled apart splits instead of breaking. In cutting through the mass, the color should be even, with no white spots showing. At this stage of the process; when the curd is in normal condition, it will probably have at least one inch of fine, silky threads when applied to the hot iron and will show from 70 to .85 per cent of acid by the acidimeter. The acid should be well developed at this state of the process, but the amount of acid is not so important as that the curd should be meaty in texture.

Knife mills ought always to be used as peg mills tend to bruise and tear the curd, injuring the texture and causing unnecessary loss of butter fat.

After the curd is ground, it is kept sufficiently stirred to keep the particles from matting together again. A further maturing of the curd takes place, during which it takes on a peculiar flavor resembling the odor of clean, rich, ripe cream when ready for the churn. It is extremely difficult to convey in words to the minds of others a definite idea of that peculiar condition characteristic of curd when ready for the salt. That is to be gained through experience. However, resort is had to the hot iron test which furnishes us with two species of evidence. If when a portion of curd is applied to the hot iron, it will string nice and silky, and if when so applied it emits an odor like nice toasted cheese and does not smell like burnt hair it is usually ready for salt. The drippings from normal curds at time of salting will usually show from one (1) to one and two-tenths (1.2) per cent acidity when tested by the acidimeter. Still these tests are not absolutely reliable in all localities and under all circumstances. Another method of gaining the desired information is by the sense of feeling and the condition of the moisture which oozes out between the fingers when squeezed in the hand.

The curd when ready to salt should not feel harsh, but soft and velvety and will exude a moisture of half fat and half whey. When salted, a clear brine should run from the curd. The temperature of the curd at time of salting should not exceed 90° F. After the salt is added the curd should be spread out thin, so that it will cool off, and when it is put to press, should be at a temperature of from 75 to 85° F. If

the curd is put to press too warm, the fat is more easily pressed out and lost.

With the majority of the rank and file of cheesemakers, it is not necessary that much should be said about the hooping and bandaging of cheese. The careful, painstaking maker is an artist in a way, and takes great pride in turning out a neat appearing cheese, symmetrical in form, neatly bandaged and perfectly closed on its surfaces. Still we often, too often, find makers who are slack in this very important part of the work. They have more or less difficulty in getting their cheese properly closed. This is true of some makers even when the curd is in the most perfect condition for pressing. Through negligence they permit the press cloths to become stiff and full of whey while the hoops are not always kept scrupulously clean. No amount of pressure will secure a good rind if the press cloths and hoops are not in first class condition. If factory operators were to exercise more care and devote more time and attention to the work of hooping and dressing the cheese, there would not be so many goods upon the curing tables with checked rinds and showing free fat under the bandages.

At the time of turning the bandages, all the whey should be rinsed out of the press cloths by dipping them in scalding water and placing them again upon the cheese as hot as possible. In the morning, the cheese ought always to be turned end for end in the hoop. When taken out they should be examined carefully to see that they are perfect in shape, and all defects remedied. Then pour water sufficiently hot to melt all free fat that may have accumulated under the circle cloth and bandage, over the cheese again before applying the pressure. This warming of the surfaces aids in the formation of a firm, transparent rind and prevents the cheese from checking. It also improves the appearance of the cheese.

With cheese as with anything else we must try to please the eye. Marketing cheese that are of unequal height or lopsided from some defect or carelessness in the process of making is always poor economy.

Let us remember that cheese is an article of food, and that it should not only be put up in a neat, attractive form, but also that it should not come in contact with anything having a bad odor.

Now in conclusion, just a word in respect to the general effect of the cheese industry and all other successful dairy business, the general effect on the country and its inhabitants.

You will inevitably notice as you leave the country in which there are no dairies and get into the dairy country, that you will find the farms better equipped, in more comfortable condition, fences in better shape, buildings larger and more comfortable, both for the people and for the cattle; you will find schools and churches, business places, banks,—and here is the reason for it. The dairy business is such that it requires constant every day attention, not only during the summer time during the growing season, but in the winter time. Now when the boys are brought up under such surroundings and know that every day and every hour brings its duty, that they must, to use a much quoted expression, "live strenuous lives," if they leave the dairy business and go into other branches they have acquired the habit of constant attention to their business, doing everything at the proper time, and I believe that if there is one class of young men more than another that has a chance



of success in any business it is those who, have been brought up on a dairy farm and in the cheese business.

I might say, Mr. Lillie, that in our state we are fast becoming accustomed to no artificial color in our cheese products. We are making a large percentage, larger year after year, of natural or whole milk colored cheese without the use of any additional color or artificial color. It is like taking the coal tar out of tomato catsup. It looks as well to us if not better without the color.

#### DISCUSSION.

The Chairman: Mr. Baer's paper is open for discussion. No one was put down to lead in this discussion, so it is open for general discussion, and if you have any questions that you would like to ask I am sure Mr. Baer will be glad to answer them.

Mr. Haven: Mr. Baer has given us a very clear, concise description of the Wisconsin method of handling cheese which they specialize in, Cheddar, but I want to bring out more forcibly the one thing that he impressed upon your mind, that is the need of care and attention. That is a deficient point in Michigan work. While in this state we do not manufacture a large amount of Cheddar cheese, the same attention and care of our product are just as essential as in Wisconsin. There is no other defect that exists so permanently in Michigan cheese work as variety and that comes from lack of attention to detail work. He specified need of proper selection of your milk, correct ripening to a certain percentage of acidimeter, described how you should cook your curd, length of time, way, etc., very carefully and that is one thing I want very much to impress upon our Michigan makers.

Right in this state a number of factories are manufacturing cheese upon practically the same methods as are followed in Cheddar cheese except that the process is not carried to as great a length as in regular Cheddar cheese, but our factories are working along that line all the way.

Another point which he brought out in which our factories are very deficient, is in reference to holding our curds at a certain temperature to mat, a very important consideration. That trouble in our state is due to two things, one is lack of care by the cheesemakers and the other construction of our cheese factories. The majority of factories in our state are not so constructed that temperatures can be controlled. Our cheese in the scoring contest showed defects caused very largely by curd becoming too cold after being taken from the whey and also too cold in the curing room.

Mr. Baer spoke about flavor of burned hair; I suppose he got that from the way his wife uses the curling iron. The temperature of pressing, 70 to 75, is another thing to which we should pay very close attention, because we have more need of that in our work than they have in Wisconsin, because our cheese carry more moisture than the Cheddar type they manufacture in that state.

Turning cheese in the morning is an important consideration which is neglected entirely, so far as I know of, in Michigan.

I was pleased to hear him speak of the cheese made in our state. We have on exhibition at the building this week a sample of cream cheese

that except on general principles would have scored 100 points. We do not like the idea of scoring anything 100, even though it is perfect because we do not like to have people think there is no room for improvement. We have samples of excellent goods along that line in Michigan. I would but call your attention to the fact that the cheese we have at this meeting will show some very high scores. The Cheddar will score as high as 97 points. We have gone beyond the limit of our local trade and as we work out into other markets we have persuaded a few of the important cheesemakers of our state to manufacture that class of stock more for outside markets. It relieves our local market from the surplus during the season when we have the largest amount of stock on it and it makes an article which goes on the outside market and compares very favorably with stock manufactured in other states.

The Chairman: Any other remarks or questions?

Mr. Baer: I want to emphasize one thing that Mr. Haven alluded to in part. I am going to say Amen to all the things he said, with reference to these monthly scoring contests, they are to you people what the cow testing associations are to the people back on the farms. Stick to those monthly scoring contests. As an educational feature they are the things we have been looking for for a long time. There is nothing along the lines of instruction in cheesemaking that appeals to me as do these monthly scoring contests that we have in Minnesota, some of the eastern states, Michigan, Wisconsin and Illinois.

I also want to set Mr. Haven right with this audience as to where I have acquired the sense of smell of burned hair. Mr. Haven, for your benefit, I am going to say I like the birds but I never have felt I could afford the feathers.

The Chairman: There are a number of good cheese men here this afternoon. We ought to discuss this subject more thoroughly.

Mr. Hoffman: Mr. President, I did not come here to say anything although I have listened very attentively and said Amen to what those men have said. I am not directly interested in the manufacture of cheese, I am running a butter factory at present. Mr. Peters is the man who succeeded me in the cheese factory.

The Chairman: We will be glad to hear something from Mr. Peters.

Mr. Peters: I do not know that there is anything that I can add to what has been said. We make in our factory big Cheddar and soft cheese. During the summer months we are compelled to find a market outside of Michigan, then we make a Cheddar.

The Chairman: Don't you make Cheddar all the time?

Mr. Peters: We have had a demand for Michigan cheese which is consumed entirely in Michigan. We find we can do better with the soft cheese due to the fact that our yield is larger and during this time of the year we find we can get fully as much for it as for Cheddar cheese. Last summer we made 83 Cheddars a day. Of course we had quite a market outside. We have a little trouble, of course, with poor milk, the same as other factories and we find we can accomplish more with a Cheddar cheese even with a poor milk than we can with soft cheese. We seem to be able to establish a better flavor even with milk that is not good, better than we can with soft cheese. We have Cheddar cheese two days in press. Soft cheese for use for quick consumption goes to

the market earlier than the Cheddar, but we find the Chicago buyers prefer to have the cheese ready in two or three days. In fact we ship them almost at once. They put them in cold storage, so that relieves us of that part of the work, and of course there is little shrinkage after they are paraffined.

Mr. Haven: I would like to ask Mr. Peters if he does not think if he would concentrate his work on the manufacture of Cheddar cheese, placing them with a good dealer and have him work up a trade, that he would receive better pay than to break in on his regular work with the manufacture of soft cheese for a short time and put them on the market with some other man? That seems the idea of some cheese men. At certain times they make a certain article, then break off and make something else. Unless he gets a very much increased yield and better price, it seems to me it would be better to put his entire product in the form of Cheddar cheese, Daisies, or whatever kind he finds the best market for.

The Chairman: It does not cost much to change and make the soft cheese as long as he has a market for it.

Mr. Haven: If you sell your butter to one firm all the year, that firm pays you better than if you ship them only once in a while.

The Chairman: I understand Mr. Peters makes a soft cheese the year round. In summer when he has a surplus of milk, more than enough to supply the market, he makes that into Cheddar and ships them into the country.

Mr. Peters: During the summer months we have a good many small factories here in the state that aim to supply the soft cheese, so we just make enough to fill our orders at a good price. We do not have any surplus so we demand a good price for our soft cheese after we make it. I have talked with Chicago buyers who are not anxious for Winter made cheese. We find we can do better on the market with soft cheese entirely in the winter than we can to make Daisies. We tried it last winter.

Mr. Gilbert: Do you make any difference in regard to the size of the Daisies and Cheddars? do you make any difference in the size of the cheese you make? How large a cheese do you make?

Mr. Peters: For Michigan trade we make from thirty to thirty-two pound cheese, unless we have an order for a smaller cheese and then we get a half cent a pound more for it.

The Chairman: Are there any other questions, Mr. Brisco?

Mr. Brisco: I have been reading Mr. Baer's views in the papers for a long time but I was very glad indeed to hear his voice. I stand with him on Cheddar cheese. I was bred in Cheddar cheese making. I learned from a Canadian a number of years ago and I could not get away from it as my patrons require I should make that kind of cheese, and the men I sell to require that I should make Cheddar, so I keep on making it the year round and would not change.

There was one point I was glad to hear mentioned here today and that was regarding care of the details in making cheese. Every man that owns and operates a cheese factory ought to be a cheesemaker himself, ought to be a man that understands the business from A to Z. There are too many men in the country making cheese who are in too

big a hurry to get out of the cheese factory and hang around the streets, for the benefit of Michigan cheese. I tell you the better product, the nicer, cleaner, product we put out on the market, the better price we will get for it. If you have Daisy cheese, made of an average 20 lbs. each, nicely paraffined, have them on your shelves five days and give them excellent care, they will take the eye of any man who wants cheese. Chicago wants that quality, prefers it to a cheese that will break down in eight days.

In our factory we work to give the buyer what he wants, I do not care what it is, but I would rather make a Cheddar cheese than anything else. When they are put on the shelves with proper care you are through with them. You do not go in there in the morning and find eight or ten going on the floor. They stand where they are put. I have seen cheese after cheese where you could pull the plug from them and they would be just like a candle, scarcely a hole. Those are the cheese we are looking for. Michigan is not the only state that is eating cheese. We have the whole southern territory south of us, south from the Mason and Dixon line, where they can make no cheese, and we have to supply them. The Daisy cheese are going into the south. They are the cheese that can stand up there. You can ship them all over the country. With proper care the older they are the better they get, and I would advise every man who is making cheese to learn to make Cheddar cheese. Insist upon it in the factory in which you are making, and your reputation will stand fifty per cent higher tomorrow when you have it learned than it is today making soft mushy Michigan cheese.

The Chairman: Do you agree with Mr. Peters? He thinks he can do better for his patrons in making soft Michigan cheese than in making the Cheddar; that his patrons will receive more for their milk? Do you know which would be the best?

Mr. Brisco: The patrons would get more money for their product if made into Cheddar because, Mr. Chairman, the cheesemaker understands his business. A man with that ability has no poor cheese to put on the market and when they are placed on the shelves and finally put on the market they are in the right condition and they are sold as prime cheese. I have not, since the first day of January last year until the first day of January this year, been discounted one cent per pound on a single pound of cheese I have sold in my factory. I superintend the work myself this year, and that is what the man that owns the factory should be able to do. I tell you you cannot run around the country and leave the hired man to make the cheese and have it a success.

Mr. Peters: I think there is a misunderstanding about Michigan cheese. I do not believe in making a mushy, sloppy Michigan cheese. Of course our first experience along that line was a little expensive and we learned something. We believe during this time of year in making a Michigan cheese that is soft, but one that will stand up and have a flavor. During the summer I find it will not do to make them too soft and I make a firmer cheese. I think there is a misunderstanding in regard to this.

The Chairman: Will your soft cheese stand shipping into southern markets?

Mr. Peters: No, they will not stand for a long shipment, although we do send them a long distance. We make them firmer during the summer months so they will stand up. I have never had a full year's make of Cheddar cheese, but on what I have made during the winter months I have found I did better by making soft cheese for our local trade.

Mr. Baer: I do not believe after all we are far apart on cheese. I believe the fine make of Michigan cheese is a cheese very closely like that I described. Six years ago I was associated with the U. S. Department, Dairy Division, in carrying on experimental work in cold curing of cheese. I purchased, at the instigation of the Department, some three hundred boxes of Michigan cheese, shipped them to cold storage at Waterloo, Wisconsin, at different temperatures, 16, 40, 45, 50 and 60 degrees. Michigan cheese at 50 degrees and below came out at the end of twelve months in first class condition, in some instances in better condition than fine Wisconsin cheese that was put in. We were of the opinion, when those goods went into storage, that they were going to develop bitter flavors because of a higher percentage of moisture they contain, but we found that was not the case when cold cured.

Mr. Peters spoke of paraffining cheese and shipping to Chicago. I am convinced that you people are on the right road all right. I think you are making the kind of cheese that you should make and I do not want it understood that I came over to Michigan attempting to change your process of manufacture in any manner. In fact what I am chiefly trying to do is just what Mr. Haven told of, to bring the proper points of manufacture and to get away from the old careless methods we have followed so long. We do it over in Wisconsin. Our last monthly contest was last month and we found the same defects in our cheese as are found in this cheese here now, objectionable flavors, carelessness in keeping up temperatures, fermentation was not properly carried out. These are the points I care more particularly about having you think of.

Mr. Bascom: If the cheesemakers have done talking about this, I would like to speak as a cheese eater. I do not know anything about making cheese but I do know what a lot of others do not know. You remember the president said, when he was making his address this morning, that if we could make the stuff good enough there would be no end to the demand for it. I notice when I buy cheese I like to go and get some more, but if I get some I do not like I stay away from it a long time. I live at Albion. A few years ago we had a fine young fellow there at the creamery and he went to the Wisconsin Agricultural College and learned to make cheese. He came back and made what I thought was a very nice cheese, we used to eat lots of it. It was Cheddar cheese, but most of the people around there did not like it because they said it was too hard; some of them thought it was a good cheese to ship but was not quite the kind of cheese we wanted to eat. He sent one of the cheese to the College, had the professor there score and examine it, and the professor's report was "You people do not know what good cheese is if you do not like that." I considered it good cheese, but I think our Michigan cheese, when properly cured, has a nice nutty flavor that beats Cheddar for eating, but when it is to be shipped there is a difference.

The Chairman: I would like to hear from Mr. Taylor.

Mr. Taylor: I learned to make Cheddar Cheese eighteen years ago but I do not know that I ever made a Cheddar cheese in Michigan; as Mr. Bascom just said, the Michigan people like a soft cheese. I make a cheese to suit my trade. I have had a retail trade for the last seven years, but in June and July when I have an excess amount of cheese I have to dispose of it to the wholesalers. Outside of that I sell to the retail trade and if they did not like my cheese I do not think they would order again. I claim I can give my patrons more money by getting a lower price for the soft cheese and a larger yield.

The Chairman: When you have this surplus do you make a firmer cheese?

Mr. Taylor: There are two or three wholesalers in this state that will take my entire output if I let them have it, so I let them take my regular make.

The Chairman: Anything further to be said on this subject? If not, we had better pass on to the next. The young ladies who were to furnish us music were not here when the program opened this afternoon, so we will take the time now to have a musical selection on the piano by Misses Wilson and Magill.

Instrumental music.

The Chairman: The next on the program is a talk by Mr. E. A. Haven, State Inspector, on the Necessity of Using Commercial Starters in Cheese Making. I believe Mr. Haven needs no introduction to a Michigan audience. He has been president of our Association and been prominently identified with it since its organization.

## NEED OF COMMERCIAL STARTER IN CHEESEMAKING.

MR. E. A. HAVEN, BLOOMINGDALE.

Mr. President, Ladies and Gentlemen:

The subject assigned to me, has not, to my memory, been presented at any of our previous meetings. We have sometimes discussed starters in connection with general cheese work, but only incidentally. The cheese business in Michigan is a little peculiar. It has been a farm to factory plan—methods developed on the farm and carried to the factory. Our cheese being sold largely in local or nearby markets, many of them shipped direct from the factory to the retail dealer, has not called for a definite or uniform process of manufacture. Each maker has followed his own method without regard to his neighbor, a free-for-all race in which each maker has been his own pace-maker, without starter, stopper, flagman or time-keeper. These conditions have developed a diversity of methods for the production of the same product, the principal difference of which has been a varying combination of cooking and acidity.

I did not see the subject until placed on the program, but I like the wording, especially the word "commercial." It conveys a double mean-

ing—Commercial starter, a valuable aid in dairying—and commercial starter, a beginning for commercial business in our cheese work. It is a subject that needs the earnest attention of our cheese men. We have passed the infant stage of our work and are in need of careful business methods.

Our individuality is becoming absorbed by increased growth. Dealers are buying more in the open market. The jobber and wholesale grocer are more in evidence as distributing agents. Market requirements demand a longer quality period—length of time for consuming—and more uniformity. All these call for a more rational method, less guess and more certainty in manufacture—a plan that gives a definite quality, within narrow limits—one that eliminates the effect of different climatic conditions, so that one kind of cheese is not made on cool days and another kind after each thunder shower. The point I want to make is that we need a definite, uniform method of handling the milk in order that we may produce good cheese each day. In my judgment, a good starter is the first aid in securing the desired product in quality and uniformity.

We know good cheese can be made without a starter. We know good cheese was made before people made any study of starters or of bacteria. We know any cheesemaker here could take good milk and make good cheese without the use of starter, but he does not always have the good milk. A carpenter can fit a board to a certain place because he knows the place to fill and the material with which he must fill it. A factory in this town will duplicate a piece of furniture because they have the same kind of material in the same condition and are to manufacture the same kind of finished product. If they had to use green, partly-seasoned, air-dried or kiln-dried lumber promiscuously and still make duplicate goods, they would have some such a problem as comes to the cheesemaker. We have different kinds of material to work with, sweet, acid, sour, clean flavored, off flavored, etc. We must sort out such as we can use and then make up a product to suit the consumer.

I maintain that the greatest defect in Michigan cheese today is uneven quality; and the greatest need of our cheesemakers is to secure more uniformity in their product. We want cheesemakers and a method of making that will take conditions as they are and produce desirable goods. That overworked excuse, that the weather was bad or the milk in poor condition, is getting tiresome. Here is where I pin my faith to my text, "Commercial starter," because I believe that by knowing the condition of the milk—and that knowledge we secure by observation on the receiving stand—and by the acidimeter or rennet test, we can, by an intelligent use of good starter, varying the quantity and time of adding to meet daily conditions, produce, within narrow limits, the same kind of cheese each day.

I know that when we speak of starter some soft Michigan makers get scared for fear of producing acid cheese. Let me say to those that the most prominent defect in soft Michigan cheese is a soggy, pasty texture and sour flavor caused by too much whey left in the curd, and that a limited amount of starter would remedy that defect and at the same time improve the flavor.

Now, don't say that I have stated that starter will take the place of

cooking, but I do say that a sour, pasty cheese would have been much better had the milk been properly ripened before setting. An acid curd does not make a sour cheese. A sour cheese is frequently made from sweet milk and at some seasons of the year a large amount of starter can be used and still make what we term a sweet curd cheese.

In our dairy school work we use two per cent, but we have only 300 lbs. in each vat. It is all one day's milk and is very sweet.

I want to fix in your minds that the object of a starter is to secure a more uniform condition in the curd each day as regards acidity or ripeness; to assist in securing a more even cooking of the curd; to lessen the chances of a sour cheese and to improve the flavor, especially when the milk is a little off.

By varying our method of handling the curd after drawing the whey, we can make any of the kinds of cheese produced in our state; soft Michigan, Michigan or Cheddar. I believe that to be a much safer plan than to keep the curd in the whey as long as is necessary when no acidity is used. Here is where our starter helps to make the maturing of our curd occur in the curd sink and not in the whey.

Have you forgotten my text? "The need of commercial starter in cheesemaking." I hardly think it best to discuss the preparation and propagation of starter, because if one is interested in the benefit to be derived from its use, he will readily learn how to use it, and if not so interested, he had best not use it at all, as a starter not properly used is an injury instead of a benefit and takes away no part of the uncertainty of our work.

Why do I advise commercial starter in preference to others, as milk or whey? I advise it because it is better. It is more uniform and has a better flavor, and you want flavor as well as acidity. Sour milk can be used but should not be. It is uneven in acidity, is apt to be curdy in texture and to have a high, sharp acid. Whey starter is the poorest of all and ought not to be used at any time. It varies too much in acidity, it carries germs from one day to another and gives an undesirable flavor to the cheese. Another strong reason against using any except a commercial starter is that any starter needs care in preparing and handling, and one who does not have sufficient interest in his work to use only the best will not give it the attention necessary to secure the best results, nor study the effect on his cheese and profit thereby. In other words, one who uses a commercial starter will give it more care than when using sour milk or whey.

I cannot leave this subject without calling attention to what we might call the abuse of starters. We often see the starter on a bench in the corner of the making room, with the rennet and color. Perhaps it is in the curing room, absorbing odors from the cheese. Sometimes, to secure ripening temperature, it is placed on top of the boiler, where it gets the dust and dirt from the boiler room. Often it is kept in an open pail or can, with no protection from germ laden air.

One case I will mention. It may be an extreme one, at least I hope it is, but in a jar containing about forty pounds of whey starter, by actual count, eighty-five flies had been drowned. Their little lives were stopped by a starter. I do not regret their death, however unfortunate for them, but I do not approve of the propagation of starter with the germs that will associate with flies.



In conclusion, let me earnestly advise you to accept the benefits that will come to you by using commercial starter. In the manufacture of soft Michigan, Michigan, Cheddar or Daisies, well prepared and carefully handled starter, used intelligently and in moderate quantity, will give good results, but by all means only the commercial, as it is the best, and the best is what we should always use.

#### DISCUSSION.

The Chairman: The subject is open for general discussion.

Mr. Murray: I have been pleased to listen to the gentleman who has just spoken in regard to starters. I think that is one of the essential things. I have used the same starter since the beginning of last April and I have got it today and it is better than when I started. We are making a Cheddar cheese and shipping to Chicago, and if the firm to whom we ship were here they could tell you what we are making. I never was a Michigan maker until this year, when I bought a factory in this state. I came from Wisconsin, have been acquainted with Mr. Baer for eight or nine years. I sold out in Wisconsin and bought a factory in Shiawassee county, Michigan. I was pleased to hear the discussion today and also the paper just read on starter, for I think starter can be used to advantage in making the soft Michigan cheese, and I am sure it can be in making Cheddar cheese.

The Chairman: Mr. Taylor, what do you say about starter?

Mr. Taylor: I believe the starter is all right, in fact I have used it to some extent myself but I have always been more or less handicapped in keeping a perfect starter and have it ready to use when I needed it. I would like to ask Mr. Murray how he keeps his starter?

Mr. Murray: In the first place we make a lactic ferment starter. We pasteurize our milk. I have a tank in which I put my milk. Of course it is preferable to have skim milk but we cannot get that in a cheese factory unless we have a separator. In commencing to make this starter we take about four pounds of milk and pasteurize it. Hold it at 212 or as near as you can, holding it at that temperature for three-quarters of an hour; then cool as quickly as possible to 75. Take this bottle of lactic ferment and stir into that; keep at a temperature of 75 from eighteen to twenty-four hours, then that starter is ready to inoculate the new starter. The next morning take the milk to be used the following day, pasteurize it, cool down to 75 and add this starter to it. That is the way we do it. The next morning we take a percentage of that, we keep it in a nice sanitary place. After we pasteurize and cool down again we add that and stir in the milk. The next morning we take a little of that again and keep on going in that way.

The Chairman: You keep what you call a mother starter in a two-quart can?

Mr. Murray: Yes, covered up in a cool place. Cool the milk to 75 before adding this starter.

The Chairman: Do you have more than one can of mother starter?

Mr. Murray: We have only one can from which we take a percentage to commence our starter on the next day.

Mr. Peters: I think the starter question is a very important one. We commenced using a starter about four years ago but our method is a little different from the one just described. I have not had very good luck taking mother starter from my original starter, but we sterilize twelve bottles in advance three days and inoculate them then, not using our original starter at all. In that way if the starter is off we do not contaminate the rest. I heat the mother starter three times.

The Chairman: Do you heat only once to 212 degrees, Mr. Murray?

Mr. Murray: Once only. You misunderstood me. We pasteurize our starter every morning, our milk every morning. This is the starter that is sterilized that we hold at 212 degrees, then cool to 75 and add a bottle of lactic ferment.

The Chairman: Mr. Peters heats that same starter the next morning, cools it down, then heats it again, heating it three times, before he puts in his ferment.

Mr. Murray: You do it differently than we do.

The Chairman: How many people in the room are owning or operating cheese factories at the present time? (Several hands raised.) How many use commercial starters in the manufacture of cheese? It is well represented. It does seem to me, from what little I know about cheesemaking and my observations about the state, that this question of commercial starter is an important question today. We will have more uniform cheese from day to day if everybody understood how to make a good starter and used it thoroughly. Are there any other remarks?

Mr. Baer. The object in using commercial starter is uniformity in the finished product. It is not used to hasten the process of manufacture so as to get out to a baseball game in the afternoon. It ought not to be used as charity is, to cover a multitude of sins or shortcomings of the milk producers on the farm; but it is used, as your president has just said, to secure uniformity and get a higher flavor; at this time of the year—Mr. Haven will bear me out in this assertion—we have no flavor but by the use of a good commercial starter, this lactic ferment that we inoculate in the pasteurized starter, gives flavor to winter or fodder made cheese.

The Chairman: And it will help poor milk a little. While it ought not be used for that purpose, some people do use it with the idea that it helps out a little when they have a batch of poor milk. Turning loose a multitude of bacteria of the right kind, they wage a successful war with the bad bacteria in the milk.

Mr. Haven: The new head of the dairy department at Lansing is here today, I presume to get some idea about cheese methods. Our work begins there soon and if anyone has any suggestions to make I know Mr. Anderson will be pleased to hear them, as I would myself. I would like to have a conference here among the cheese men.

The Chairman: We would like to hear from Mr. Anderson too.

Mr. Anderson: I came here to get a line on the cheese business in Michigan. I had something of a line on this before but I came to hear cheese men get together, and I must say that in this state there are those who are making Cheddar cheese, those who are making soft cheese

and different grades of soft cheese. I am aware that there is a diversity of preference in the matter of cheese with the consumer. Cheese that suits one customer does not suit another. This is not true of butter. As a rule, butter that suits one customer suits another, but it is much different with cheese. As a lad I was raised in a Cheddar cheese section but I never liked Cheddar cheese very well, and I do not today. When I came to Michigan I was exceedingly enthusiastic over soft Michigan cheese. It reminded me of those few pieces of good dairy farm cheese that I had been able to get hold of when I was a boy, and although my taste may not be up to the standard I am exceedingly fond of soft Michigan cheese. There is a variety of tastes. I have seen the Cheddar business for a long time and realize there are some things against an excessive production of Cheddar cheese. There are some financial and business things about it. They load up the market at times and then you have to cater to an export rather than a home consumptive trade. Somebody has got to keep his money invested in that product and sometimes you receive the results of one year's work the next year. I have thought that it would be a good thing for Michigan to produce some of the higher price cheese and some of those produce a larger yield, and I have gathered here that some are able to secure a larger yield from Michigan cheese than from a strictly Cheddar type. I would like to hear further discussion on the matter of cheese. It is the hardest proposition we have today, so far as the dairy school is concerned, because if we knew where the men were going we could train them along that line. I would like to give them a good training in starters, and there will be a thorough training in starters.

The Chairman: Are there any further remarks?

Mr. Courtright: I would like to hear from some gentleman here that is making butter from whey. This may not be on the cheese side of the question, but if anyone here makes butter from whey I would like to hear from him.

The Chairman: Do you know of anyone in Michigan making whey butter?

Mr. Hallewell: I have just returned from quite an extensive trip through New York state and have had a chance to study this whey butter proposition, in fact made it a point to look into it very thoroughly with the expectation of starting it in our own factory. I find it is a very profitable thing and if our soft Michigan cheese is anything like the cheese they are making there, and if the amount of butterfat that goes into the whey is anything like what goes into their whey, we are losing a quantity of money in our whey tanks every year. They tell me that after the butterfat is taken from the whey it does not injure the feeding value of the whey, because the whey is either drawn from the tank or the fat not utilized. I have a statement from factories that make whey butter, and shows that the butterfat from whey amounted to 3 pounds of butterfat to one thousand pounds of milk.

Mr. Courtright: Is that whey butter sold as whey butter?

Mr. Hallewell: No sir, it is shipped the same as creamery butter, in fact they claim it is creamery butter.

Mr. Baer: We have in Wisconsin about 650 Swiss, Brick and Limburger cheese factories. They manufacture in the early Spring and late

Fall, Brick and Limburger cheese in those factories. During the summer months when they are on full grass milk they almost exclusively manufacture Swiss cheese. You know Swiss cheese is made in round Swiss cheese kettles with fire underneath. They manufacture Swiss cheese in round kettles because they want round holes in it. In the process of manufacture they break up the curd into a dough, and in doing that they use a Swiss heart. They keep the temperature raised from 118 to 135 degrees Fahrenheit. In doing that there is over one per cent fat left in the whey, and it a very remunerative feature of the Swiss cheese making business to produce a butter, termed whey butter. I know they are putting separators into those factories and producing a butter that as a rule, when properly made and tempered with ice and commercial starter, is equal to fine creamery butter. We have not attempted to make it in our factories manufacturing American cheese. We have thought that where there was only .3 of 1 per cent butterfat lost that it would hardly pay for the expense of the churn, separator and ice necessary to produce a fancy article of butter which would bring a good price and pay for the power that it would take to operate the machinery, and the outlay of money necessary to equip a factory for the manufacture of whey butter; but it is a very remunerative feature of our Swiss cheese manufacture over there, but remember in the process of manufacturing Swiss cheese we are losing anywhere from .8 of 1 per cent to 1.2 per cent of butterfat in the whey.

The Secretary: Are they not installing separators and shipping their butterfat to a central point?

Mr. Baer: I know of one or two places where this is done. It is a new feature with us but I understand it will be taken up quite extensively this coming season.

The Chairman: Any other questions about cheesemaking or commercial starters? If not we will pass to the next subject, "Making Soft Michigan Cheese With a Curd Mill," by Mr. L. R. Sigafoose, of Montgomery. Mr. Sigafoose is not here but he has sent his paper to the secretary who will now read it.

## MAKING SOFT MICHIGAN CHEESE WITH A CURD MILL.

MR. L. R. SIGAFOOSE, MONTGOMERY.

Mr. Chairman, Ladies and Gentlemen:

Mr. Wilson has asked me to present a paper on "The Making of Soft Michigan Cheese with a Curd Mill," and to begin with I wish to say, that if Mr. Wilson could furnish me with the necessary equipment to work with I could give you a practical demonstration much easier than I can prepare a presentable paper on the subject, but I will try to give you a brief outline of my method. Some one has said that necessity is the mother of invention, and so I have found it. When the regular method of cheesemaking failed to give satisfactory results on account of gassy or floating curds and overripened milk I had to invent

some other way to make good, and save from loss. If a cheesemaker receives fairly good milk in fairly good season in the morning he can get along allright in the usual way; but on the other hand, if the bulk of the milk is quite late getting to the factory in the morning and in a community where aerators are practically unknown and some herds of cows running much of the time on wild, swampy and marshy lands, then a few of you may realize what a cheesemaker is up against many times during hot weather, and occasionally when the weather has nothing to do with the case, namely all kinds of milk to contend with and all kinds of curds to handle I began to use the curd mill to help work out the gas and bad flavors and found it a very great help. When the curd is dipped into the curd-sink to drain I stir it thoroughly and, if needed, wash with cold water. All must use their own judgment about when to use the cold water or to not use it. Then put the curd through the curd mill and sprinkle on about one-half of the salt needed for the whole; stir thoroughly again and add the balance of the salt required, keeping it well stirred and in granular form from twenty to forty minutes, then proceed to press.

#### DISCUSSION.

The Chairman: Gentlemen, this question is open for general discussion. Mr. Haven, what do you say about using a curd mill in soft Michigan cheese?

Mr. Haven: I believe the use of the curd mill is what we might call the other leg of this desire to work for uniformity. That is what we are concentrating our effort to in inducing the manufacturers to use a starter and curd mill. Many think if they use the mill they are going to make a close firm texture of cheese but they are mistaken, they can make as soft a cheese with the mill as without it and eliminate much of the unsanitary defects and unfavorable conditions in the milk. We have been handicapped all the way through in the instruction work of the Dairy & Food department by the fact that there are a number of methods that produce practically the same results. One factory will be cooking at a certain temperature, several degrees higher than another factory; one maker will be holding the curd in the whey while others believe in an early dip and they will practically produce the same results with good milk, but at the same time it does not leave an inspector or an instructor a chance to demonstrate any certain line of manufacture, and in order to get that on a more definite, businesslike basis we are doing all we can to persuade the makers to use a reasonable amount of starter, varying according to the kind of cheese he wishes to make, and then use the curd mill. We have found a number who have tried that method with very good results. We shall use that view in the dairy work as long as I have anything to do with it, endeavoring to get cheesemakers to use curd mill and starter in any kind of cheese made in the state.

The Chairman: Mr. Taylor, do you use the curd milk?

Mr. Taylor: I have a curd mill but about the only time I ever use it is when I have bad milk in hot weather. I find I cannot get the yield with the use of the curd mill that I can by the granular form. I would like to ask Mr. Haven if he has not found that to be the case, that we

can get a better yield in the soft cheese in granular form than with the curd mill?

Mr. Haven: I believe you get a better yield if you have some good milk so you can load it up with that whey and take your chances of having it sour on you afterwards, or work it off on the trade before it gets a chance to sour. But month after month a good cheesemaker will take a curd mill and make a soft Michigan cheese and get more yield with less loss from poor milk than without. I would like to ask Mr. Horton what he thinks of the curd mill. They started out last year, as an object lesson, with one mill.

The Chairman: Is Mr. Horton in the room? He is not here.

Mr. Taylor: I cannot let that assertion go by. Mr. Haven seems to insinuate that I load my cheese with whey and dispose of it as soon as possible. He knows very well that I invariably store cheese in January and cut them the next March or April.

The Chairman: Soft Michigan cheese?

Mr. Taylor: A soft Michigan cheese, and I never had them returned to me when I put them on the market.

The Chairman: Mr. Dear, what have you to say about using the curd mill in making soft Michigan cheese? Do you favor it?

Mr. Dear: I certainly do in connection with the starter. I do not think the mill would amount to much if we did not have a starter in connection with it. The trouble is in making soft Michigan cheese we have the gas and the mill does not take any of the gas out in particular, but you are matting your curd therefore you have to use your mill in order to get it ground up into proper shape for hooping.

The Chairman: By using the starter and curd mill you are more apt to get uniformity from day to day?

Mr. Dear: That is it. We get better flavor because we have the starter to work it.

The Chairman: Mr. Peters, do you want to say anything on this subject? Do you use a curd mill?

Mr. Peters: Yes, we use a curd mill and we use it on soft cheese. Of course we also use a starter and I find we get better results. I would not consider the curd mill of any benefit to me if I did not watch my acid. It is necessary to have the acid or starter so as to get the curd in a certain condition, or without it your curd mill is not necessary.

The Chairman: Any other remarks? We have time enough to discuss this a little farther if you care to do so. Mr. Richards, what do you say about using the curd mill?

Mr. Richards: We always use it.

The Chairman: Do you make soft Michigan cheese?

Mr. Richards: Yes, we do.

The Chairman: Do you also use a commercial starter?

Mr. Richards: We have not got at it yet although we think it is a good thing.

The Chairman: Anyone else anything to say? It seems we can use the curd mill even if we do not use starter.

Mr. Haven: Here is an individual cheesemaker, understanding his own market requirements and conditions, who can make cheese that

will suit his trade by almost any method, with a starter or without. Some other cheesemaker in another section will have a trade somewhere else and will have a method that will suit his trade. Four or five men all the same way because each man knows about what his trade demands and can make an article to supply that particular demand.

The Chairman: He is educating the consumer to his way of thinking.

Mr. Haven: You often find a cheesemaker in one town will sell a cheese in another town, while the cheesemaker in the other town will sell in the first town. The idea is if you have to go outside of that market which you have built up for your own particular goods you will want a different goods. A few years ago if the Chicago markets got hold of a cheese branded "Michigan cheese" they would scrape the brand off, because it was utterly impossible to buy five hundred boxes of Michigan cheese anywhere near even in size, quality of texture. We have in this building now soft Michigan cheese varying from 20 pounds to 91 pounds in actual weight. You will find pretty nearly every variety all the way through. If we are going to build up a trade outside of our own state we must have cheese more uniform and when a buyer comes to market and buys one particular lot he pays a better price, and that is where our Daisy cheese makers are making a winning article, because their cheese are uniform. Let a buyer go through the store room of a Michigan factory and find three hundred or five hundred cheese of uniform size, nicely arranged on the shelves, the very appearance of those cheese helps in the sale. In the next factory with another lot of cheese, one cheese will be higher than the other, on weigh more than the other, etc., etc. We will never get a good reputation for our Michigan cheese in the large markets, as we increase in the amount of our production, unless we formulate some system or different practice, whereby every factory will adopt the same method and obtain practically the same result.

Member: Do you think commercial starters or the use of the curd mill would regulate the size of your cheese?

Mr. Haven: If you were living in Flint and had a door yard in which you let everything accumulate, never run a lawn mower over it or cut the weeds, and your next neighbor might be a little more particular and keep everything nice, have rose bushes and trees around his yard, after a while you would begin to say "That fellow's yard looks nicer than mine and I will try and fix mine up." I believe some of those things have a moral effect on us. I believe if a man is sufficiently interested in his work to use a commercial starter and use a curd mill and make a study of his conditions, in a little while he will realize there is something to do and it will tend to uniformity in size, shape and texture. If a man does a good act once he is more liable to do another some other time. Those little things must be attended to and that is why I think in this state that will give Michigan as a state a dairy reputation. The dealers in Wisconsin do not say Horton or Freeman make a good cheese, they want to build a reputation as a state, and we want to get a reputation for Michigan as Michigan, and not for individual shippers. The only way to do that is to get our men to work towards a common point, a common cause, because every poor cheese

made in Michigan and put on the market takes the place of two or three better ones, and when we get our factories so they will make a uniformly good cheese, I do not mean the best kind of cheese, but the same kind of cheese every time, we will have taken a big step in advancement.

The Chairman: I do not see how the curd mill and starter can have anything to do with making cheese of a uniform size.

Mr. Bishop: You understand with the curd mill we get the required firmness. That is what we want in our hoops, is so many pounds of cheese and day after day it does not vary over an ounce or two in the amount. The commercial starter and the curd mill are the only friends the cheesemaker has in all this world. If it were not for these two he would surely be up against it. The farmer, the cow, and everything else is against him.

The Chairman: So you argue the curd mill and starter does have something to do with uniformity in size?

Mr. Bishop: The cheesemakers have educated their patrons wrong. They work to get the largest amount of cheese, regardless of quality.

The Secretary: Is the starter and curd mill inclined to make large cheese or small cheese?

Mr. Bishop: You can make them as large or as small as you desire; 60 pounds, 80 pounds, 20 pounds or 10 pounds.

The Chairman: The idea is you get a more uniform grade and you can put the amount into the hoop that will make the same amount daily.

Mr. Taylor: Mr. Briscole has added scales to the curd mill and starter. We can all use the scales whether we have the curd mill or starter in getting uniformity in size.

Mr. Briscole: I learned that from Canada. We always worked to get the greatest amount of cheese we could, without regard to quality, made the best work, but I learned there to go after quality, not quantity. If you can take a lot of poor milk and make good cheese out of it, do it without regard to the amount of milk necessary to do it.

The Chairman: Suppose you had a competing factory close by where they paid the farmer more for his milk than you could, what would you do then?

Mr. Briscole: Suppose I was getting fifteen cents for my cheese and he was getting thirteen cents for his?

The Chairman: Sometimes it is claimed they can get as much for soft Michigan cheese as for Cheddar.

Mr. Briscole: You can take poor milk and by using lactice acid and curd mill and working and handling, you can make a good quality of cheese from it. I have been in the factory until 10 o'clock at night nursing them, trying to get instilled into them respectability.

The Secretary: I believe, from the discussions I have heard in this Association for the last twenty-five years, that the curd mill and the commercial starter are the proper things to use, but I do not believe that either one has anything to do with those 30 pound or 90 pound cheese. I have not the least doubt that the man who made the 20 pound cheese used the commercial starter and the curd mill. I merely asked the question to start a discussion, as to whether the starter or curd mill had anything to do with the size.



I think at this time of year the quantity of milk in the vat has more to do with the size of the cheese than any other one thing.

Mr. Haven: I am very much surprised that a man who has been secretary of this Association for 16 years should talk about my statement in reference to a curd mill making a difference in the size of the cheese. There was nothing of that kind said. I did say at this exhibition we had cheese varying from 18 to 95 pounds. I used that to illustrate the fact that we lack uniformity. I am much surprised that he should state I said that curd mills or starter had anything to do with the size of those cheese. I simply brought that out to illustrate the fact that we had a great variety.

Mr. Peters: I would like to say something about the average. They say we get the biggest average when we make the soft cheese. I have not found that so. I am located close to Elsie, and we all know the reputation of the Elsie cheese. They can get more for their cheese than we can get at Chapin, right along for soft cheese. We found we were on the same basis as they, the pooling basis. It took about 12 pounds of milk to make cheese most of the season, but it got so far we had to go on the butterfat basis three years ago and in less than two years we could sell cheese for a cent a pound less than Elsie and pay from ten to fifteen cents a hundred more for milk, so it is not altogether the make of the cheese. It is a good deal the way they are made.

The Secretary: How do they purchase milk for cheese factories in Wisconsin, Mr. Baer, by the pool system or Babcock test?

Mr. Baer: There are about 50 per cent of the Cheddar cheese factories that buy their milk on the butterfat basis. There are only 5 per cent of those factories, 600 or 700 factories, that manufacture a foreign type of cheese that are paying for milk on a fat basis. However, most of our factories are equipped with the Babcock testers and they do not skim too low. The dairy and Food department has been in the habit of bringing 120 to 125 or 150 of those cases into court each year, which has had a very wholesome effect in some localities. We have one county with 84 cheese factories and every factory pays for milk on the butterfat basis. We are getting one and one-half cents a pound for making. That is what the factory charges the patrons for manufacturing. Unfortunately we have not had as much success as we anticipated when we started out with a crusade over the state of having the factories pay for milk on the butter fat basis. We have people in Wisconsin now who are feeding cattle with the sole object in view of producing a whole washtub full of water and converting that into cheese. I do not know where the end is going to be. We actually have herd after herd, grade stock as well as registered, that will not produce 3 per cent of butterfat.

The Chairman: How about this test for casein? Is that ever going to be practical, in your opinion?

Mr. Baer: This last year there were sixteen factories in Wisconsin that used the casein test as a basis in connection with the Babcock milk test in determining the relative value of different milk received at those factories, and with two exceptions the reports have been very favorable to the adoption of the casein test in connection with the Babcock test. You understand the casein is a more concentrated factor in milk than

butterfat and a composite sample will do. Those who have gotten out the test recommend that the test be made often. We anticipate great things for the casein test.

The Chairman: Do they find as much casein in this milk that tests 3 per cent as they do in richer milk?

Mr. Baer: No sir, never.

The Chairman: Are there any other remarks? If there is nothing further to be said on this subject we will pass it for the time. The program states we are to have at this time report of the judges of dairy product, but I understand those judges are not ready to report yet. Then we are to have short addresses by old members and others. I do not know how much time you want to take up with this. Is there anyone here you would like to hear from?

The Secretary: I think of the original members that helped organize this Association there are only two in the room, that is Mr. Haven and myself.

The Chairman: We have heard both of you talk before. If there is no one you wish to call on, we will pass on to the question box. If anybody wants to ask a question, he is welcome to do so at this time.

Member: I would like to have Mr. Haven tell us what he knows about wash curd cheese.

Mr. Haven: I do not know anything about it. Mr. Baer perhaps would know more about it. As a usual thing we have enough water in our milk here so we do not need to soak the water into the curd.

Mr. Baer: Until last year we practiced quite extensively in Wisconsin what was known as rinsing our cheese curd just before pressing or just before salting. We simply dashed a few pails of hot water, that is water at from 100 to 112 degrees F., simply dashed it over the curd to remove that sticky white whey. Our object in doing that was to get this whey out of the way and open up the pores of the curds so the salt would dissolve quicker. We used a little more salt therefore and our curd went to press clean and free from this oil and leaky thick white whey.

The Chairman: I will now appoint the committees. The secretary's report has been referred to the directors, so that relieves the chair from appointing an auditing committee. I will appoint the committee on Resolutions as follows:

Resolution committee: N. P. Hull, Dimondale; Wm. N. Oliver, Grand Rapids; F. H. Vandenboom, Marquette.

It should be borne in mind that Mr. Weld will illustrate his talk on Market Milk this evening. We would like to get some consumers from the city in to hear Mr. Weld's lecture. There are also to be talks by Mr. Crobert, of Jackson, and Mr. Lewis B. Hall, of Grand Rapids, on Market Certified Milk.

If there is nothing further to come before this meeting, we will stand adjourned until 7:30 o'clock this evening.

## WEDNESDAY EVENING SESSION.

Meeting called to order at 8 o'clock by President Lillie, and opened with piano duet by Misses Magill and Wilson.

The Chairman: This morning it was voted to have the report of the committee on by-laws at this session, because it was thought best to have some of the workings of the Association governed by the new by-laws, should you see fit to adopt them. If we deferred the reading of these by-laws until Friday we could not act on them. I would like to know if the chairman of that committee is ready to report now? Mr. Bechtel, we will listen to the report.

## REPORT OF COMMITTEE ON BY-LAWS.

W. H. BECHTEL, CARO, CHAIRMAN.

Mr. Chairman, Gentlemen of the Convention:

Pursuant to your orders, the committee appointed met and drafted the following, which we respectfully submit and recommend the adoption of same.

## CONSTITUTION.

## THE MICHIGAN DAIRYMEN'S ASSOCIATION.

Incorporated under the provisions of an Act to incorporate the Michigan Dairymen's Association, approved April 26th, A. D., 1895.

## ARTICLE I.

*Title.*

The name by which this Association shall be known in law, shall be the "Michigan Dairymen's Association."

## ARTICLE II.

*Place of Business Office.*

The place of the business office of the Association shall be the residence of the Secretary.

## ARTICLE III.

*Objects.*

The object and purposes of the Association shall be to secure the co-operation of dairymen and to promote the social, moral and business interests of its members; to procure and diffuse scientific and practical knowledge in all things pertaining to the business of dairying and to the manufacture and sale of dairy products.

## ARTICLE IV.

*Qualifications for Membership.*

Any person actively engaged in any branch of the dairy industry may become a member of this Association, on being recommended by an officer of the Association, and on payment of the required fee. Local dairymen associations may obtain memberships as provided in the by-laws.

## ARTICLE V.

*Officers.*

The number of its officers shall be as follows: Directors, five in number; President, Vice-President, Secretary and Treasurer.

## ARTICLE VI.

*Annual Meeting.*

The annual meeting shall be held during the second week of February each year, or upon such other date as may be decided by the members at the annual meeting, or by the executive committee when not so decided.

## ARTICLE VII.

*Penalties.*

Any person violating the requirements of the constitution or by-laws, shall be subject to reprimand or expulsion.

## ARTICLE VIII.

*Amendments.*

It shall require a two-thirds vote of the members voting at any annual meeting to alter or amend this Constitution.

## ART. I. BY-LAWS.

The officers of this Association shall consist of President, Vice-President, Secretary and Treasurer, and five directors. The offices of Secretary and Treasurer may be held by the same person.

Sec. 1. All officers shall be elected at the annual meeting. The nomination of President, Vice-President, Secretary and Treasurer, shall be by ballot. The three persons receiving the largest number of votes for each office shall be declared candidates for said offices.

Sec. 2. The election of President, Vice-President, Secretary and Treasurer shall be by ballot. The candidate receiving the majority of the votes cast shall be declared elected.

Sec. 3. The election of members of the Board of Directors shall be by acclamation, unless otherwise decided by the members of the association.

Sec. 4. No member shall be allowed to participate in the election of officers who does not wear the official badge of the Association, and who has not paid his annual dues in advance. The presidents and secretaries of auxilliary associations who have paid the annual dues for such associations, in advance, shall each be entitled to one vote.

## ART. III. TERM OF OFFICE.

The term of office for all officers shall begin with the beginning of the fiscal year, July 1st, following the election, and shall be for one year, or until their successors are elected.

## ART. IV. ANNUAL MEETINGS.

The annual meeting shall be held during the second week of February each year, or upon such other date as may be decided by the members at the annual meeting, or by the executive committee when not so decided.

## ART. V. SPECIAL MEETINGS.

Special meetings shall be called by the President at the request in writing of five officers or twenty-five members of the Association. Notice of special meetings shall be given by the Secretary by mailing to each a written or printed notice thereof, at least one week prior to such meeting. This notice shall state the object of the meeting and no other business shall be transacted thereat.

## ART. VI. QUORUM.

Twenty members shall be necessary to constitute a quorum at all meetings.

## ART. VII. VACANCIES.

Vacancies in the executive committee caused by death, resignation, or otherwise, may be filled for the unexpired term by appointment by the executive board. Any member of the committee of statistics, or of special committees, who shall refuse or neglect to perform the duties assigned to him without reasonable excuse, shall be deemed to have resigned, and the vacancy shall be filled by appointment by the President.

## ART. VIII. DUTIES OF THE PRESIDENT.

The President shall preside at all meetings of the Association. He shall call all special meetings as provided in Article V. He shall appoint all special committees when not selected by the Association and sign all official documents and perform all duties usually assigned to that office.

## ART. IX. DUTIES OF VICE-PRESIDENT.

The Vice-President shall in the absence of the President preside at all meetings of the Association, and perform the duties usually assigned to that office.

## ART. X. DUTIES OF THE SECRETARY.

The Secretary shall keep full and accurate minutes of all acts and proceedings of the Association and of the meetings of the executive committee. Shall have charge of the books, records and papers of the Association, shall collect and pay into the treasury all fees, or other monies received by him for the Association; shall in a book for that

purpose, cause the name and full address of each member of the Association to be placed, and when notified of a change of location, alter the address accordingly; he shall also perform all other duties properly belonging to such office.

#### ART. XI. DUTIES OF TREASURER.

The Treasurer shall receive the funds and all monies collected by the Secretary, and under the direction of the executive committee shall disburse the same; he shall keep books of account and preserve vouchers for all monies paid and perform all other duties properly belonging to such office.

#### ART. XII. DUTIES OF EXECUTIVE COMMITTEE.

The President, Vice-President, Secretary, Treasurer, and the five Directors, shall constitute the executive committee, a majority of whom shall constitute a quorum. It shall have the management and control of the business of the Association, shall perform the duties of a finance committee, audit the claims against the Association, audit the books of the Secretary and Treasurer, and perform such other duties as the Association may desire.

#### ART. XIII. FEES AND DUES.

Sec. 1. Every member of the Association, except life members, who pay \$10.00 once for all, shall pay into the treasury an annual fee of \$1.00.

Sec. 2. Local dairy associations may become affiliated with this Association by paying into its treasury 50 cents a year for each member of their association.

Such association shall receive one annual report for each of their members, who have paid their annual dues. The President and the Secretary of such local associations as have paid their dues, to the state Association, shall each be entitled to one membership in this Association.

#### ART. XIV. COMMITTEE OF STATISTICS.

The President shall at each annual meeting appoint a committee of statistics, consisting of three members. Its duties shall be to gather information on all subjects of interest bearing directly on the interests of this Association, and report the same in writing at the annual meeting.

#### ART. XV. COMMITTEE ON RESOLUTIONS.

The President shall at each meeting appoint a committee of three, whose duties shall be to draft resolutions and to present them at the meeting.

#### ART. XVI. EXPENSES AND LIABILITIES.

Necessary expenses that may be incurred with the approval of the executive committee, shall be binding on the whole Association, and paid from the funds in the treasury. Should there not be sufficient funds in

the treasury, the executive committee may assess each member pro-rata, and collect such money at once; provided, however, that such assessment shall not exceed \$1.00 in any one year, without the unanimous consent of the Association.

ART. XVII. COMMITTEE ON ENTERTAINMENT.

The President shall at each annual meeting appoint a committee consisting of three, which will have charge of the entertainment of members at the social session at each annual convention. Said committee shall hold office until the close of the next annual meeting.

ART. XVIII. AMENDMENTS.

It shall require a two-thirds vote of the members voting at any annual meeting to alter or amend these By-Laws.

ART. XVI. ORDER OF BUSINESS.

At all regular meetings the following order of business shall prevail:

1. Reading of minutes and report of Secretary.
2. Report of standing committees.
3. Report of special committees.
4. Unfinished business.
5. New business.
6. Election of officers.

No member shall speak for more than ten minutes, or twice on the same subject, except by general consent. Robert's Rules of Order shall be accepted as standard authority, when not in conflict with these By-Laws.

W. H. BECHTEL,  
W. F. RAVEN,  
HELMER RABILD,  
Committee.

Mr. Bechtel: I move the adoption of the by-laws as just read.

Mr. Burns: There is just one substitute that I think would be in order. The committee recommends that no one shall be eligible for membership unless he is recommended by the executive board and I believe for convenience sake, a substitute could be offered by which two members in good standing could have their recommendation accepted, because it is not always convenient to find the executive board. I would suggest that any man recommended by two members be eligible for membership in this Association.

Mr. Raven: I think that says to be recommended by an officer of the Association.

Mr. Rabild: The secretary is an officer, so why could not his recommendation be sufficient?

The Secretary: The greatest trouble is I have quite a number of assistants here and we do not have time to look up people or get recommendations and what we want is the dollar. If we happen to get any one that is objectionable you are going to expel me from the Association for taking money contrary to the by-laws of this Association. It

seems to me the old by-laws covered that the best of anything so any-one could join the Association by paying a dollar. I think we will miss a lot of dollars if we do not leave that undisturbed.

Mr. Rabild: I have looked up the names on the Michigan Dairy book and I fail to find a single member we would miss if we adopted those by-laws, and I would like to have you name one Mr. Wilson.

Mr. Raven: I support Mr. Bechtel's motion for adoption of the by-laws.

Mr. Smith, Hart: If not out of order, I think we could make one correction with reference to local associations. As I understand the by-laws, they call for the president and secretary as representatives. It might be that the president and secretary could not attend and as the by-laws stand, if we adopt them, I do not think we would have the authority to adopt a substitute; therefore I believe a few words should be added to the effect that the president, secretary be delegates, or other persons selected from the local association.

The Chairman: It would seem to me this proposition would be all right, because if there came a time when we wanted someone shut out of this Association we could do it, while under the old by-laws we could not, we would have to take anyone that offered a dollar. I cannot see how any harm could come from it and I can see how good can come from it.

Mr. Betchel: If this by-law was left as formerly, it would mean a wide open door to this association. We had not protection whatever.

Mr. Wilson: Here is the article we have been working under for twenty-four years: "Any person of good repute may become a member of this Association on payment of the required fee." That seems to me is a little broader. I offer that as a substitute just to see how it will be acted on.

The Chairman: What is the substitute?

The Secretary: The old article.

The Chairman: You understand now that if this substitute is carried we will have simply the same by-law that we have always had. If it is not then we will have to vote on this as a whole.

A vote being taken, the substitute was lost.

Mr. Marston: Why would it not be better to have the secretary register as each member votes? We do that in a good many of the other associations. I would like to offer that as an amendment, that the secretary have a pole list and as each member votes register his name.

Mr. Wilson: I suggested to this committee that the names of the candidates be printed on the Australian ballot and that the directors have a day set during the convention and register the name of every voter, the same as if they were voting for any city officer. It seems to me that would avoid all feeling and show a spirit of fairness. I would like to see it incorporated in the by-laws that the officers be voted for under the Australian ballot system, under the direction of the Board of Directors, and I offer that as a motion.

Motion seconded by Mr. Marston.

Mr. Burns: It seems to me you will have trouble in this.

Mr. Raven: Do we understand then that a man has to have five members to recommend him before he casts his vote?



Mr. Marston: I think the report of the committee cannot be improved upon. I merely suggested that they carry a ballot list and register. Mr. Wilson has improved upon that but the nominations are already taken care of.

Mr. Bechtel: I think you will find the article says the voters must have their official badges on, and that ought to be a safeguard. I do not see, according to this by-law, how anyone can vote unless he has a badge. I do not see how they can stuff the ballot box unless they have badges.

The Secretary: The reason I suggested this other way is because we could then have our voting for two or three hours and not disturb the convention and it gives every member a chance to cast his ballot, it gives a more representative vote of the convention than any vote you can get.

Member: I suggest that the Chairman enforce the rule that no member should speak more than once on a subject.

The Chairman: It is not yet adopted. Gentlemen, you have the substitute for this mode of election as recommended by this committee, the substitute being that we adopt the Australian ballot system.

Mr. Burns: Don't you think the committee's recommendation is about as good as we can have it?

The Chairman: Of course I cannot see any objection to this Australian ballot system but it hardly seems to me, personally, as if it would be necessary.

Dr. Robinson: Could we not go home and find out that we did not have any officers elected? Would it not be possible to have the votes so divided that there would not be anyone elected?

The vote being taken on the Australian ballot system, the ayes were in the majority so the amendment was lost.

The Chairman: Now we will have the original motion to adopt the report of the committee as read.

Mr. Smith, Hart: I move that in the article of the by-laws governing the local associations that we just add to the President and Secretary as delegates, "If not able to attend they can appoint other members of good standing in their local association to act as delegates."

Motion seconded and carried.

The Chairman: Of course I cannot see any objection to this Australian amended. All those in favor of the adoption of the by-laws as read and amended, signify by saying aye. Contrary no. The ayes have it and the by-laws are adopted.

The Chairman: The Chairman of the Board of Directors wants the privilege of reading the report.

## REPORT OF BOARD OF DIRECTORS.

W. F. RAVEN, BROOKLYN, CHAIRMAN.

Mr. Chairman and Gentlemen:

The Board of Directors, to which was referred the books and accounts of the secretary, report as follows:

We, the undersigned, Board of Directors of the Michigan Dairymen's Association, have examined the Secretary's books and vouchers and found them correct according to his report.

W. F. RAVEN,  
C. R. WEBB,  
HELMER RABILD.

Directors.

To the Board of Directors of Michigan Dairymen's Association:

Recommend, First, That the annual programme of the Association be published by the secretary under the supervision of the Board of Directors, and that all moneys received from advertisements therein, shall be placed to the credit of the Michigan Dairymen's Association.

Second, That the portion of the President's address bearing upon the manufacture and sale of Oleomargarine be referred to the committee on resolutions.

Third, That the Michigan Dairymen's Association select a committee to draft a bill adopting a state standard for ice cream and regulating the manufacture and sale of commercial ice cream and present it to the legislature.

Fourth, That the Michigan Dairymen's Association select a committee to draft a bill adopting a state standard for certified milk and regulating the production and sale of the same and present it to the legislature.

Fifth, We recommend that the enforcement of the two aforementioned bills when enacted in the law be placed under the control of the Dairy and Food Commissioner.

Sixth, We recommend that the portion of the President's address relating to auxiliary dairy meetings be referred to the executive committee.

W. F. RAVEN,  
HELMER RABILD,  
C. R. WEBB.

Directors.

I move the adoption of the report.

Motion seconded and carried.

The Chairman: We will now listen to an address by Mr. Probert, of Jackson. Mr. Probert is to talk to us on the Past, Present and Future of the City Milk Supply. I do not think Mr. Probert needs much of an introduction to an audience of Michigan dairymen. Most of you know him or know of him. He is engaged in the production of first class milk for the city of Jackson, he is also a breeder of note and a worthy member of this association, who knows what he is talking about. I take great pleasure in introducing Mr. Probert to you this evening.

## PAST, PRESENT AND FUTURE OF THE CITY MILK SUPPLY.

MR. H. F. PROBERT, JACKSON.

Mr. President, Ladies and Gentlemen:

For the last fifteen years I have been in this line, both in a practical way and scientific way, of feeding, breeding and production along the various stages.

They refer me to the past. You all know what the past in the milk business was. Going back twenty, thirty or forty years we all know what a small business it was for the dairymen, only a few small dairies scattered over our country here and there, only a few men in the business at that time. The consumers used only a small amount of milk daily. The old milk man came with his old milk can and his old dipper measuring out the milk, with his old fashioned bell and the housewives waiting at the door for the milk man, and he dealt out to them whatever he pleased. They used to tell a strange story of the milk man using the pump freely and they continue to tell that story today. In those days the milk man was thought little of, his product was given little attention, it had very ordinary care and was generally consumed the same day it was produced. Today our cities have grown, and the populations have run up into the thousands and in many cases into the millions. The milk business of today has become one of the great industries of this country. There is no getting away from it. It has grown equally as fast as any other branch with which agriculture has anything to do. The development of that business has been very marked the last few years, and the product has been materially improved.

Today the milk man is licensed; both by the city in which he delivers his product and by the state. His product is under careful inspection. His premises are likewise inspected by the authorities and his product analyzed by the authorities, and it must conform to the legal requirements of the state. All these safeguards have been thrown around his product and around his business.

The milkman of today delivers his milk in glass bottles with paraffined caps, his milk tickets are allowed to be used only once. The milkman no longer rings his milk bell at the door but he waits upon the consumers; he is even required to deliver his product into refrigerators in all parts of the house. The customers require very much of the milk man of today. These are some of the conditions that we find in the smaller cities. In the larger cities we have conditions that are still more elaborate and extensive.

Going back again to the past, we find the price of milk only a slight amount lower than is paid for this fine article of today. In those days an inferior product was produced, today a superior product is produced.

You who were present at Battle Creek last year will remember a great tirade that Dr. Kellogg, of the Sanitarium gave us dairymen on milk. You recall how he almost blackguarded it in our own eyes because he called it one of the filthiest articles of food that mankind used.

He told us how filthy and awful the product was when it was received at the sanitarium and how they had to boil and cook and sterilize it before they gave it to their patients. He failed to tell us what became of all the filth they pretended to destroy. I presume he fed that to the patients also. He told us they were going to be so charitable as to ask the milk man to accept more money for his product. I investigated his conditions, in fact I knew something of the conditions existing at his sanitarium before Dr. Kellogg addressed the convention, but after that I took occasion to investigate the conditions existing between the sanitarium and the producers. I found that the Kellogg Company had used every possible means to reduce the poor dairyman's price down to the last penny. The doctor told us the thousands of gallons they consumed a day at the great sanitarium, and the price they paid was the very lowest. The product they got was the very lowest because the good dairymen did not have to sell to them. He was going to ask them to accept a little more. I had some milk on exhibition at the convention at Battle Creek and Dr. Kellogg told me if he could get milk of that quality he could afford to pay 25 cents a quart for it. I knew he would not pay any such price so I did not enter into any conversation with him. Of course I would have been glad to receive that price. I know he could afford to pay 25 cents a quart for good milk because I know every patient he had there paid many times that price for every quart of milk they consumed. They did not let any of their patients out on any low price.

About the production and consumption of milk—I began the consumption of milk years and years ago. I look young but I have spent fifty years on earth. I was nursed by my mother and most of you were likewise nursed by your mothers. The milk man had no business in my home. The amount of milk consumed in our home was very small, I do not believe we consumed over a pint a day in a large family of seven children. The mothers of today leave their homes, the children are born in the hospitals; within a few hours after the milk bottle is placed in the babe's mouth and the cow becomes the foster mother of the child, and the child never knows the mother's breast. There is a new customer for the dairyman. Those customers are coming into the world every minute, and from the time of its birth the cow has to take care of the child. The consumption of milk by a child increases with the age of the child and I question if that child ever ceases to be a good milk consumer. Doctors tell us that it is only a matter of time before the human race will cease to be milk givers. What is going to become of mankind when that happens. It is the duty of the milkman and the dairyman to produce a superior article of milk. The demand is great along this line but the inducement for the dairymen to produce such an article is not what it should be because the only inducement the dairymen can get out of this is the money and profit there is in it for him.

The dairymen of today have nearly twice as much to pay out for labor as the dairymen of years ago. His feed bills are at least double what they were a few years ago. His taxes, his licenses and other additional expenses adds up dollars and cents. No matter what volume of business he has he has all these expenses to pay, so the small dairyman

has quite enough to take care of. The consumers value the quart of milk by the old price paid years ago, they seem to set five cents a quart as the standard for the product, yet today that same consumer does not hesitate to go to the grocery store or to the market and pay fancy prices which the times have demanded. They do not measure the value of the article intrinsically as an article of food and the milk man has to contend with the old standard set.

There is no article of food that comes into the house today that is a better balanced or cheaper food than good, clean, wholesome milk. A quart weighs practically two pounds. The food in milk is the best on earth for the infant one day old, for the child of various ages or for the invalid or the old person nearing the end. There is no better article of food today, and why should not mankind do all in their power to improve that one article that is leading all other articles of food? True, we are not all milk consumers, but the masses depend upon it. The large cities today are calling upon the rural districts for a greater supply of milk. Our large cities cannot get a sufficient supply of dairy products. We have a great field before us today, we farmers and dairymen, but before the conditions can be brought about that will satisfy every demand, the dairymen must have a better price for their product and the sooner the city consumer begins to realize this the better it is going to be for the dairy business.

I know we have with us Dr. Weld of Washington, who has been doing a great amount of good along this line and it seems to me a waste of time for me to continue talking to you on this subject and I am going to make my talk short in order that Dr. Weld may have more time. I will therefore close to be followed by the next speaker on the program. Thank you.

The Chairman: The next on the program is "Certified Milk" by Mr. Lewis B. Hall, whose boys I understand are dairymen. I believe Mr. Hall never milked a cow in his life. He is an insurance agent but he is a graduate of the Michigan Agricultural College, and I take great pleasure in introducing to you Mr. L. B. Hall.

### CERTIFIED MILK.

MR. L. B. HALL, OF GRAND RAPIDS.

Mr. Chairman, Ladies and Gentlemen:

Certified Milk is a term coined by Dr. Coit of Newark, N. J., to designate clean milk produced under the immediate supervision and direction of a medical milk commission appointed by local medical societies. It originated some fifteen years ago in that city, when the leading physicians, led by Dr. Coit, became desperate over the milk supply, and instituted a vigorous campaign against the uncleanly and careless methods of dairymen, and evolved a scheme whereby the babies and invalids of the cities could have the benefit of clean milk, the same as the babies and invalids of the country.

Immediate beneficial results from Newark's commission, coupled with the well-known principle of medical practice that clean milk from healthy cows is second only to mothers' milk for infants, has led other medical societies to adopt the same scheme, and today, certified milk is being retailed in the principal cities of the country. It was branded at that time and is today, by those least competent to judge, as a fad of the medical fraternity; and in this connection, I am reminded of good old Dr. Abbott of M. A. C.

One day, in a recitation in logic, to illustrate this point, he submitted a proposition I shall never forget. He said, "The scientists say that evolution is a correct theory. I am a theologian. If the scientists say evolution is correct, I shall accept it, because I know nothing about it." Would that others might always appreciate the full text of that statement. It is easy for us to allow our warm breath to float over our vocal organs in denouncing conclusions reached by individuals, who have often spent years of study to attain; and in memory of good old Dr. Abbott, I am always in my mind, led to inquire, "What do they know about it?"

One year ago, you were told from the platform of your convention, by a man of broad education and practical experience, that the greater portion of milk used in the raw state was a poison, rather than a food, and no reply was made to that statement, except the stale argument, "We have lived and grown to a good old age. Why should the present generation want anything better?" If the occupants of the cemeteries could speak, they might tell a different story. The same course of reasoning would prove that war was a healthful occupation, because thousands have spent years among flying shot and shell, and have survived beyond the good old age of three score and ten. Half a century ago, the family physician, upon being called, would proceed immediately to extract a pint of blood from his patient. The critics of pure milk would hardly stand for that today, even though our forefathers survived the ordeal.

I met a prominent attorney on the street a few days ago and in conversation, he said, "The tuberculin test is the biggest humbug the medical fraternity has ever launched upon the public." I said, "You are an attorney. What do you know about it?" He replied, "Not a darned thing." Then let us be fair with the proposition at the outset, and give credence to conclusions reached by individuals, who know whereof they speak. The medical fraternity are and should be the conservators of the public health. Hence, we should be slow to condemn methods proposed for the public good. The public should and does demand that their physicians be wide awake, progressive individuals; and we are quick to relegate to the rear any who are living in the good old times and practicing the good old methods. The minute we are sick and in distress, we cry out for the family physician, and are quick to obey every order. Why then should we be slow to respond to suggestions made to retain our health?

The campaign for clean milk, which is being waged by the medical societies, is an unselfish service for the public good. They have no money invested in the certified milk plants—they receive no rebate for the milk they use, neither do they get a rake-off for recommending the

milk. (I might say that in Grand Rapids, the doctors do get a rebate on the milk they use. We charge them 10 cents a quart, the same as everybody else, for milk that should retail at 12 cents a quart.) If nature demanded five or six million bacteria per c. c. for its subjects, she would have furnished it. But careful investigation, shows that milk drawn from the cow's udder contains very few, if any bacteria, and the greatest number ever found was less than 3,000 per c. c., and those due to the fact that many creep up the lacteal ducts from the surrounding atmosphere. And where these campaigns for pure milk have been prosecuted to the development of certified milk plants, the infants mortality has been decreased from 20 per cent to 50 per cent.

It seems to me that dairymen, like the railroads and similiar corporations, have abused the privileges and opportunities they have enjoyed, until the public has demanded tribute, and the manufacturers have rushed in, and today, thousands of dollars are being paid for prepared foods to take the place of the product that nature prepared absolutely clean, and the dairy farmers of the country are paying the penalty of their own carelessness.

We are often asked how we produce certified milk, and we as often reply, "With water." It is simply a question of absolute cleanliness. They say "Cleanliness is next to Godliness." But in certified milk, it goes it one better. It is Godliness, because to be unclean in the production of milk, one of the principal food products used in the raw state to feed and nourish the delicate organisms of our babies and invalids, is ungodly, if not damnable. It doesn't require elaborate and expensive buildings and equipment. In fact, such expenditure of money in certified milk plants has proved a failure, both from the production of clean milk and from a financial point of view as well.

Before entering into the production of certified milk, one should pay his relatives and friends at a distance a visit and bid them a last farewell, because as long as he is in the business, he will never visit them again. Three or four hours is the longest one can absent himself from the premises, unless he has for assistants those equally interested. The more gray matter one possesses above the ears, the better milk he will be able to produce. The more he knows about the Whys, the better he will execute the Hows. He must learn early to appreciate the fact that "almost right" is always absolutely and unqualifiedly "Wrong." He should never have a plant so large that he cannot keep one eye on the milking room and the other on the milk room.

His buildings may be plain, but must be well lighted and ventilated, and surrounding premises thoroughly drained. The atmosphere must be free from dust particles. Everything the milk touches must be thoroughly sterilized by coming into immediate contact with live steam for at least half an hour before being used; the milk exposed to the air as little as possible and the temperature reduced to a degree close to that of freezing at earliest possible moment after milking, and kept there until delivered to the customers' ice boxes. The health of the herd should be carefully watched and at least every ten days, a competent veterinary surgeon should inspect it. Nothing but pure food should be placed before them, and hand your pocket book to your employees as quickly as the feed can, unless you are present. Close atten-

tion to every detail, with a dogged persistency, will lead to success in the certified milk business, as in other lines.

Milk being used extensively in the raw state, should be guarded more than most any other food, and especially, when used as food for infants and invalids. About the only test the general public can make of milk is the amount of cream and whether any dirt appears in the milk or not. Milk may be apparently free from dirt and show a good amount of cream, and still be unfit for use. The secretions of the stable are all soluble in milk, and it is only when you have a saturated solution that solid particles appear. Some dealers advertise that their milk is all put through the separator and the dirt taken out, but bless your souls, the centrifugal force of all separators in the country won't precipitate the secretions of the stable, when once in solution. It isn't what you can see in the milk that causes the trouble. It is what you do not see.

In the winter season, when cows are shut up in poorly lighted, poorly ventilated stables and then not properly cleaned daily, and milk cans are brought in and placed in the stable, and the operators proceed to milk in open pails and empty the milk into the cans, all the time remaining in the stable until the milking is finished, clean milk is an absolute impossibility under such conditions. So it is a matter of grave concern to the city whether its milk supply is properly protected. In my judgment, no milk should be sold in the city unless bottled by the producer and each bottle bearing a cap with the producer's name. Then the milk inspector could do effective work. The pure food laws compel the producer to place his name on every package. Why not the milk as well? Then cooperation in the delivery of the milk would reduce the cost of sale and production to a minimum and improve the quality in a high degree. Milk showing a bacterial count in excess of 100,000 per c. c. in summer, and 50,000 per c. c. in winter should never be allowed sold; and milk in freezing weather, giving a count of 20,000 or more per c. c., is unclean milk. A system of this kind might increase the price of milk, but it would also increase the public health and decrease the doctors' bills. The price of milk in the city of Grand Rapids is entirely too low to warrant an investment by the better class of farmers, and we see no reason why the dairy farmer should sell 15 cents worth of nutrients for 6 or 7 cents. We believe if the dairymen of this vicinity would modernize their present dairy methods, 8 cents per quart could be secured as easily as 6 cents under the present system. At present prices of feed and labor, there is no business profit in ordinary milk at 8 cents a quart, and absolutely no business profit in certified milk at 10 cents a quart. There is fair remuneration for one's labor, but no business profit. However, a commodity of such moment to the public health should be sold at a price within reach of everyone. We have just one other thought to suggest.

The only kings and queens in this country are the farmers and their wives; and I wouldn't spoil the atmosphere of royalty which permeates every farm home by sitting up nights to get your products to the cities' doors before the morning sun shines. I can readily see why some retailers of milk want to get their delivery made before sunrise. But if milk is properly prepared, it can be as easily handled during the reasonable working hours of the day as any other product.



In conclusion, we are pleased to say to one and all, at 7 o'clock A. M., and 5 o'clock P. M., Hall Bros. Certified Milk plant is in operation and open for your inspection, if you choose to come and see how we do it. You will see no tinseled attendants or marble basins, but you will see modest apartments, where for the last seven months, we have produced certified milk for the Kent County Medical Milk Commission with a bacterial count at no time above 4,800 per c. c. and counts for the winter months, for the most part, either slightly above or very much below 1,000 mark. You are welcome.

The Chairman: We are now ready to take up the last subject on this evening's program, "Improving the Market Milk Supply" by Mr. Ivan C. Weld, assistant in market milk investigations. I take great pleasure in introducing to you Mr. Weld.

### IMPROVEMENT OF THE MILK SUPPLY.

IVAN C. WELD, DAIRY DIVISION, U. S. DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.

Mr. Chairman, Ladies and Gentlemen:

The subject to which I invite your attention—Improvement of the Milk Supply—at once suggests that further improvement of the milk supply is possible, and desirable. This being the case some of the questions involved are:

- 1st. What is the trouble with the present milk supply?
- 2nd. How can the milk supply be improved?
- 3rd. Who can or will improve it?
- 4th. Is it "worth while" or is there any reward for those whose product finally reaches a higher standard of cleanliness?

The first question may be answered in many ways, and by people from every walk of life. The answers echo and re-echo from city to city, and from one end of the country to the other, and an observing person will often find most convincing evidence that the milk supply as a whole is not all that it should be. In one investigation 144 samples of milk from dairies and milk delivery wagons and groceries in every section of a city of over 300,000 population were examined. Some of the bottles were filled from cans of milk at the place of purchase but most of the milk had been previously bottled and the samples were taken at random from the cases. The samples therefore fairly represented the quality of milk received by the people of that city at that time. The fat showed a variation from less than 2 per cent to more than 7 per cent (average 4 per cent), the solids not fat from less than 7 per cent to more than 9 per cent (average 8.52 per cent). The total solids varied from 9.5 per cent to 15.6 per cent (average 12.6 per cent). The acidity or degree of sourness varied from .141 per cent to .284 per cent (average .195). The foregoing relates only to the composition of the milk and does not in any way refer to its fitness for food. A further

examination of the milk showed every sample to contain a greater or less amount of sediment or undissolved dirt. The amount varied from an exceedingly slight distribution of fine specks to an amount sufficient to blacken the bottom of an ordinary milk bottle.

The number of bacteria in the various samples showed great variation. The counts were as follows:

Eight samples contained from 2,200 to 10,000.

Ten samples contained from 10,000 to 25,000.

Twenty-three samples contained from 25,000 to 50,000.

Eighteen samples contained from 50,000 to 100,000.

Thirty-three samples contained from 100,000 to 200,000.

Twenty-one samples contained from 200,000 to 500,000.

Six samples contained from 500,000 to 1,000,000.

Twenty-six samples contained from 1,000,000 to 12,800,000.

Highest count, 12,800,000.

Lowest count, 2,200.

Average count, 941,000.

Many of the samples contained gas forming bacteria in large numbers. In some cases the flavor or taste of the milk was not greatly affected. In others the taste was materially changed and decidedly disagreeable.

That the facts and figures presented regarding the milk supply in the city above referred to could be duplicated in scores of cities of similar size will not for a moment be doubted by any one familiar with conditions. That such conditions should exist in the milk supply of any city is deplorable and they could not exist but for the fact that consumers of milk are, as a rule, ignorant of the source of their supply and the conditions under which milk should be produced and distributed. Unlike most farm products milk cannot be judged by appearance alone, and the only practical way in which a city consumer of milk may be helped in securing a good supply is through the medium of proper standards for cleanliness and composition and thorough and systematic and thorough inspection. It is also important that the sources of the milk supply be guarded from contamination and this movement has been undertaken by many of the more prominent, progressive cities throughout the country. The widely varying conditions under which milk is produced and handled is shown by one investigation as follows:

Two hundred dairy farms in a dozen states were inspected and rated according to modern standards of Dairy Sanitation. Out of the two hundred places inspected the highest scoring dairy was entitled to 99.8 points out of a possible hundred. The lowest scoring dairy was entitled to only 9.5 points. The average score of the entire 200 places inspected was 39.04 points out of a possible 100 as perfection.

So far as the eye could determine, the dairy cattle have, with but few exceptions, been found in fairly good condition. Their condition as regards tuberculosis is not known except on about 30 of the 200 farms where the tuberculin test is intelligently and systematically used. Ten of the 200 stables contained 4 square feet of window space for each cow stall, and received the highest possible score for that item. Eight of the 200 stables had from 3 to 4 square feet of glass; 30 had 2 to 3 square feet; 48 had from 1 to 2 square feet; 60 had somewhat less than

1 square foot of glass per cow, and 44 of the 200 stables inspected were entirely without windows or light except as it might come from open doors or loosely constructed stable walls. Seventy of the 200 stables have no movable windows; 118 stables have movable windows, but only 12 of the 200 have a good, automatic, ventilating system. Twenty-four of the stables have tight, sound floors. In other cases, floors are slightly imperfect, loosely constructed, decayed, or entirely lacking. In at least 100 of the 200 stables inspected, animals other than cattle are kept in the same stable. Horses and cattle are frequently found together and fowls of various kinds also help to make some places unclean. Seventy-one of the 200 stables have from 500 to 1,000 cubic feet of air-space for each stall and receive a full score. On 95 of the 200 farms, all manure is regularly removed 30 feet or more away from the stable. Fourteen dairies out of the 200 are using small-top pails for milking and also 8 out of the 200 provide clean outside clothing for the men when milking.

An examination of the milk pails, cans and strainers used on the 200 farms made clear the fact that these things are often not *as clean* as the people using them *imagine* them to be. Traces of milk were found in many seams and covers and in only 58 of places could all milk utensils be pronounced superficially clean; that is, thoroughly washed and scalded, and given a full score for that condition. On 95 of the 200 farms some attempt was made to clean the cow's udder, or the milker's hands, or both, previous to milking. Milk coolers were found in use on 48 farms. In but 39 instances, however, was the milk actually cooled to a temperature below 60 degrees. Not over ten thermometers were found in use on the 200 farms and in at least 195 instances out of 200 *positive knowledge regarding temperature of milk could not be obtained except by the use of the investigator's own thermometer*. In 40 instances the milk was stored at a temperature below 50 degrees F., previous to delivery, and in 34 cases ice was used in transportation or in delivering milk to consumers.

On 126 of the 200 dairy farms there were found separate, special rooms or buildings in which to care for the milk. This feature was entirely lacking on the other farms where the milk, in some instances, was handled and kept in the stable, dooryard, cellar, or some part of the dairyman's house.

The foregoing explains only in part the cause of the present movement for a cleaner, better milk supply. Another thing to be considered and included in an answer to the first question is the equipment and the methods employed by proprietors or managers of city milk plants. These distributing plants in many cases buy their entire supply from the farmers and in turn distribute the product to city consumers.

A recent and thorough inspection of 22 such places has shown that here, too, the equipment and methods commonly employed in handling and distributing milk in cities are sometimes far from being what they should be. Of the 22 places inspected, the one scoring highest was entitled to 60.3 out of a possible 100. The poorest place was not entitled to a single point. The average score of the 22 places was 28.66 points or about 7.5 points lower than the average score of the 91 dairy farms. In some cases the equipment for receiving and distributing

milk has been little better than a shed, a tank, and a horse and wagon. Cans, bottles and measures are frequently washed in the proprietor's kitchen and it is sometimes impossible to find where family affairs end, and the milk distributing business commences.

A review of the cold facts and figures here given in answer to the question "What is the trouble with the present milk supply" might prove discouraging were it not for the fact that some evidence of improvement along some one or more lines is found on nearly every farm and in many city distributing plants. Furthermore, there seems to be a very commendable desire on the part of all progressive, intelligent dairymen who are engaged in the production and distribution of milk and cream to improve their present equipment and to make use of better methods just as fast as the need for it is clearly seen and understood.

The second question "How can the milk supply be improved?" and the third, "Who can or will improve it?" are questions that are already being answered in many places. These questions are being answered by dairy papers, dairy officials and by milk producers and milk dealers whose actions speak louder and more eloquently than words. Even one who spends much time in traveling among dairymen can hardly comprehend the changes and improvements that have been made, and are now being made, by milk producers in all parts of the country. We are all gradually coming to understand more clearly the true meaning of "cleanliness" in its relation to the dairy industry. Milk and cream are also coming to be recognized as important factors for the bettering of the milk supply. In this work certain definite, mathematical values are given flavor, composition, bacteria, acidity and appearance of package and contents. Each of the foregoing conditions are examined and rated according to their merits on a score card and such ratings when added, constitute the score of the milk sample under consideration, one hundred points constituting a perfect score.

It will be observed that a milk and cream contest systematizes and makes possible a study, in details, of the various influences affecting the milk and cream supply and the producers when armed with a proper knowledge regarding these influences can guard against contamination at every point.

Those dairymen who read dairy papers and attend institutes and meetings and milk and cream contests where matters pertaining to their business are discussed usually become pioneers or leaders in the movement for cleanliness in their own localities and their influence should be and often is, both great and good.

There is unfortunately a much larger number of producers and distributors of dairy products who do not read dairy literature and do not leave their places of business to search for new ideas. Such producers can only be reached by dairy inspectors. Through some form of dairy inspection these people must be *made* to see the cleaner way and to improve their conditions. That form of inspection, therefore, will be of greatest service that goes most thoroughly into the details and most clearly points the way. It was because of the general absence of well defined methods of procedure in the work of dairy farm inspection that the Federal Government interested itself in establishing the score card system of dairy farm inspection in all parts of the country. This

system requires the *inspector* as well as the dairyman to *see* and to study the details of dairy equipment and dairy methods and to discuss and record existing conditions in clear, definite terms which can neither be misunderstood or misinterpreted.

Those dairymen who do not of their own accord seek to improve their business can only be helped through a system of dairy farm inspection that is educational in its nature. Failing to profit by that, and to rise to the established standards of their market, they will naturally be eliminated from the milk business.

To the fourth and last question, "Is it worth while, or is there any reward for those whose produce finally reaches the higher standard of cleanliness" we must find an answer.

The standards of cleanliness governing the production and distribution of milk have been and should continue to be raised by health officials until the production and distribution of milk is entrusted to those and those *only* who have proper equipment and facilities for carrying on the work. The man who has a proper knowledge of the work and who is willing to supply a clean, safe product, should not be held down in competition by those who have neither proper knowledge or equipment and who make the production of milk a neglected side issue rather than a properly conducted business.

If it is better to build a fence about the top of a precipice than to maintain a hospital and graveyard at its bottom, then the more progressive dairymen and health officials by working and conferring together must come to an understanding and seek to establish and live up to such standards and requirements as will remove from the milk supply the least possible danger or suspicion.

The better class of producers, distributors, health officials, and the better class of city newspapers should combine their forces and influence and use the means at their command to teach consumers the *truth* regarding the value of *clean* milk and some other things they do not generally know, and of which they cannot in ignorance judge for themselves. The public should be made acquainted with the fact that a quart of clean milk is easily worth in actual food value 12 cents or more. The public must be made to realize that they have long been buying for about fifty cents a full dollar's worth of food material. If to the bare cost of maintaining a farm and feeding cows and caring for the products in a very ordinary way there shall be added the cost of *cleanliness*, of healthy cows, proper equipment, and clean methods, throughout, *who* can justly complain? Will not such a procedure be for the direct benefit and health of all concerned? Will there not be less discomfort, worry and loss of time and money because of illness? Will not the consumption of milk increase when it can be freely used with perfect safety? I believe all this is possible and that it is a condition that in a few years is to be generally realized even as it is now realized in some places in a comparatively small way. Fortunately the price of cleanliness plies the bare cost of production need not be so great as to impose any hardship on the consumer. He may not then, as now, when he buys milk be able to get a full dollar's worth of food material for *fifty cents* but he will still be able to buy milk, and *clean milk* too, at bargain prices. It has been clearly demonstrated in many places that

it is "worth while" and that there is a financial reward for those dairy-men whose premises and product finally reach a higher standard of cleanliness. *We must, eventually, have clean, wholesome milk.*

The Chairman: This concludes the program for the evening. Remember that we have no session tomorrow morning. We are supposed to give our time up to viewing the exhibits. There will be an interesting session tomorrow afternoon, the buttermakers' session. If there is nothing further to come before this meeting, we will now stand adjourned until 1 o'clock tomorrow afternoon.

---

#### THURSDAY AFTERNOON SESSION.

Meeting called to order at 1:45 o'clock with President Lillie in the Chair.

Piano duet by Misses Wilson and Magill.

The Chairman: The first topic on the program this afternoon is the subject, "Is it necessary to ripen cream before churning?" This subject was to have been presented by Dr. Marshall, but the doctor, whom you all know, cannot be present, and Dr. Otto Rahn, who is doing experimental work with Dr. Marshall at the college will take this subject. I scarcely know the speaker but it is a sufficient recommendation to know that he is connected with the M. A. C. and with Dr. Marshall in his work there. I take pleasure in introducing to you Dr. Rahn, who will discuss this subject.

Dr. Otto Rahn: About a week ago Dr. Marshall told me that he promised to come to this meeting but could not come, so asked me to take his place. I hesitated at first because it was not very advisable to go as a substitute to Dr. Marshall but he said he had nobody else to send so I promised to go and asked him what his subject was. He gave me the program and I found there "Is it necessary to ripen the cream before churning?" I asked what that meant and he said "I don't know." I asked him what I should say to the meeting and he said "Whatever you please." I must apologize first because I am not a dairyman, I am a bacteriologist, and if I do not come to the point you desire I ask to be excused.

## IS IT NECESSARY TO RIPEN THE CREAM BEFORE CHURNING?

DR. OTTO RAHN, AGRICULTURAL COLLEGE.

Mr. President, Ladies and Gentlemen:

This question can be understood in several ways, and possibly we can answer it with a simple *yes* or *no*. We can certainly make butter without ripening the cream—for instance, sweet cream butter; therefore, it is not necessary to ripen the cream in order to make butter. But the market for sweet cream butter is very limited, and it is usually made only on special order. The unusual flat taste and its bad keeping qualities prevent its playing any role in the butter trade of the United States.

In speaking of butter, we generally mean sour cream butter, and naturally the question which I am trying to answer, refers to sour cream butter. In order to discuss this problem or answer, we must first know:

What is the ripening of cream?

You all know that the ripening process consists largely in the production of acid by some bacteria, which ferment the milk sugar or lactose into lactic acid. If the ripening were nothing but the production of lactic acid, buttermaking could be made very much easier; we could just add .5 per cent of pure lactic acid to the sweet cream and churn immediately. I would save the time of ripening, would save a good deal of room, of steam, and of equipment in the creameries and there would be no chance for off-flavors to develop during the ripening. If, however, the butter-maker goes through all the trouble of ripening the cream, he must have some good reason for it.

You cannot make wine by mixing grape juice with alcohol. You get some kind of a drink, but no wine, and a child could tell the difference. The aroma of the real wine is made by the yeast during the fermentation. We have the same thing in our cream ripening. Besides the acid, the bacteria make aromatic substances. The flavor of butter contains more than the slightly sour taste of the lactic acid. There is something else in it that we cannot describe very well, something that we call butter-flavor and butter-aroma, because we find it only in butter or ripened cream. This something, this aroma, is made by the lactic acid bacteria in a secret process, which neither chemists nor bacteriologists have succeeded yet in imitating. Each bacterial cell is a chemical factory of its own. Because the process is secret and we want the products of it, we cannot do without these minute factories, and because we cannot add the aromatic substances to the cream as we can with the acid, we put the whole chemical plant into the cream and let it act right there. All we can do, to help it, is to furnish the proper conditions, especially the right temperature. If we cool the cream too low, the fermentation would stop entirely, and if we keep it too high, the factories might work too fast and produce undesirable by-products; we call such cream "too acid," or "over-ripe," or just "strong."

The right kind of bacteria and the right temperature are the two most important factors. The right kind of bacteria is almost always present in milk, but occasionally in so small numbers, compared with other germs that these get ahead of them and develop undesirable flavors before the desirable lactic acid bacteria finally succeed in fighting them down. They will, almost without any exception, win in the struggle, but it may be too late; the off-flavors are in the cream. It is, therefore, advisable not to run the risk and depend upon the rather unreliable presence of the lactic acid bacteria, but to add them in form of a good starter, to the cream. Once present in large numbers, they will overcome very much easier any harmful organisms.

From this short definition, it would seem necessary to ripen the cream for the production of good butter. But what about that old gathered cream, which in many creameries is the only cream obtainable? Such cream is ripe, or over-ripe, has usually the right acidity, or too high an acidity, for churning, but very seldom the right flavor. There are only a few ways of improving such cream, and even then the butter cannot be first class. The old, stale flavor of such cream can be removed partially by adding freshly skimmed milk, and then this mixture is ripened with large amounts of starter. The dilution will decrease the acid and remove some of the bad flavors, and the starter also may, to some extent, overcome them. Another way is to dilute the cream with skimmed milk or water and separate it again, and then ripen it with a heavy starter. This second method is more effective than the first one, because it removes much acid and much odor, but it means also more work and more time. Fresh skimmed milk is not always available and the use of water is not always advisable. Pasteurization will help considerably in destroying undesired bacteria and also undesired odors.

There is still another possibility of understanding the question: Is it necessary to ripen the *cream* before churning? This question must be answered strictly with "no." It is not necessary to ripen the cream; we can churn sweet cream with a large amount of ripened, skimmed milk and get an excellent sour-cream butter. The ripening flavor does not depend upon the presence of fat, and is developed in skimmed milk as well as in cream. This way of churning has been highly recommended, though it is said that the loss of fat is a little larger than in the churning of sour cream. From the bacteriological standpoint, this method seems very promising for good keeping butter. The ripening of the pasteurized skimmed milk can be carried on practically without contamination, and if the cream added has been pasteurized before, we should expect a good butter. There is also an economical advantage: if off-flavors should develop during the ripening process, it would mean only a loss of skimmed milk and not of cream.

Another way of getting the aromatic substances of the ripened milk into the butter is to incorporate some good starter into butter with undesirable odors. This method cannot be recommended highly, because the incorporation of curd will affect the keeping qualities of butter. The flavor of fresh starter will stay only for a short time, and then deterioration will take place rapidly because of the high casein content.



It is an entirely different question, if it is necessary to use a starter in ripening. I touched this point before when speaking about the ripening in general. The lactic acid bacteria are usually present in milk, and almost invariably, milk will become sour if it stands for some time. But there are many strains of lactic acid germs, and you do not know which one will develop in your cream. Not all roses smell alike, and not all peaches taste alike, so not all bacteria smell and taste alike. If we want to be absolutely sure of the right kind, we must add it in sufficient quantities and provide the best conditions for development.

Let us in a few words review the instructive history of the starter.

About fifty years ago, the French chemist, Pasteur, published his paper on the fermentation of beer, in which he, as the first, proves that fermentation is caused by a living organism. Some twenty years later, this discovery was taken up by Hansen to improve the fermentation in breweries. Hansen proposed to sterilize the wort or malt extract and ferment it with a pure culture. This method of making beer was very much more expensive than the old method, but it is taken up now by all breweries. The more expensive way pays, because it is perfectly safe and reliable, the quality of beer is the same in every fermentation and no foreign fermentation can start in. About ten years after this method had been started in the breweries, the same way was proposed for the cream ripening at the same time by the Danish bacteriologist, Storch, and the German bacteriologist, Weigmann. That was about fifteen years ago. During the last five years in the large butter exhibits in Denmark and Germany, there was scarcely a single sour cream butter that has not been made from pasteurized cream with a pure culture starter. We have to consider that Danish and German creameries do not suffer at all from old, gathered cream; the whole milk is brought to the creamery daily or twice each day. If, even under these favorable conditions, they prefer to pasteurize their cream, there must be some great advantage in it.

Some well-known dairy scientists claim that the very finest flavor of sour-cream butter does not develop in pasteurized cream with a pure culture. That is quite possible. The finest butter aroma can perhaps be produced only by a certain mixture of germs which we do not know. But the large creameries do not usually specialize in such fancy butter. They have to answer the demands of the market by furnishing a good, reliable good-keeping butter. This reliability especially made the butter-makers on the other side of the ocean pasteurize the cream and use a pure culture. The butter dealer can pay a good price for a butter which will be of the same quality summer and winter. If he cannot depend upon the quality, he will not be able to supply as many customers, and if his business suffers, the butter-maker will suffer just the same.

If the cream is always pasteurized, the starter always made from the same pure culture, the ripening temperature always the same, there is hardly a possibility for a change in the quality. The butter-market wants a regular supply with butter of the same good quality. The butter-maker can meet this need by taking the necessary care. The expense of pasteurization, pure cultures and regulation of temperature

may be considered as the insurance premium against off-flavors and rapid deterioration of the butter.

The cold storage always prefer butter with light, flat flavor. They have learned by their own experience, and by that of others, that such butter keeps. Butter with light, flat flavor is made either from fresh cream or from pasteurized cream with a pure culture starter. If old, sour cream is churned, there will be a strong flavor in the butter even if a starter is used. Pasteurization will destroy part of this old flavor and destroy, also the germs which produced it; accordingly, there is no more possibility for its increase.

We come to the question:

Why do many American buttermakers object to pasteurization, and even to the use of starters, while Danish and German buttermakers use it so extensively? The one—perhaps most important—reason is the greater amount of work required by these more improved methods. In Europe, the buttermaker can easily hire a man or boy to help him, in the United States, such men are scarce and their wages are about twice as high. But there is still another reason: If you give a sharp knife to a boy, he will do more harm than good with it; he will cut himself and then throw it away as something harmful, while the knowing, grown, experienced man can hardly do without it. Exactly the same thing happens to the creamery man with the starter. If he understands exactly the meaning of a starter and of pasteurization, he will use it to great advantage; if he does not know what a germ, and a pure culture and a starter are, his so-called starter will soon contain all kinds of bacteria and will start all kinds of odors. The butter-maker decides then, the starter is of no use, and in the next meeting of the dairymen's association, he will tell every one that he has tried starters for four weeks and it did not improve the butter at all, but he had more expense and more work.

It is true that a starter made without care is worse than no starter.

The great danger and difficulty is the carrying on of the mother starter. The sterilization of the starter bottles, the proper care in transferring, the breakage of the bottles in steaming and cleaning, make considerable work and expense. The one thing that is needed is a starter which would compare with the bread yeast; a starter that is so cheap that every day a new portion could be put into the cream and would ripen it directly. It would save all the work and expense of carrying on the starter, if you could simply open a tin can, dump the bacteria into the cream and let it ripen. All attempts to make such direct starters for a reasonable prize have been in vain, until a short time ago a new method has been tried which seems promising. If this method should be really successful, more creamerymen would believe in starters, because they would have no more chance to do anything wrong.

The Chairman: This subject is to be discussed by Mr. Walter Hall. Mr. Hall needs no introduction to any audience of buttermakers. He has the reputation of making A-1 butter. He has won several contests in buttermaking. I think we will all be glad to have Mr. Hall discuss this question, "Is it necessary to ripen cream before churning?"

## DISCUSSION.

Mr. Walter Hall, Elsie, Mich.: Mr. Chairman, Ladies and Gentlemen: It is pretty hard to start a quarrel with a man when he has it all on one side, and the doctor has stated my views of the case. I had hoped he would take the other side so I could find a little fault but it does not seem to be possible.

There is a method whereby the starter can be added to the cream in the churn. Mr. Credicott, of Chicago, has investigated that method so perhaps we will hear from him later on. If his theory is practical it would save a great deal of labor and expense, and from conversation I have had with him on the subject I believe he thinks it is practical.

I understood the doctor to say if a person had the same temperatures and the same starter and if his cream was always pasteurized he would always get the same results. I hardly think so, because if we had the same conditions all the way through, the same temperatures and the same starter, I believe in the winter time, when there are more hard fats in the butter, that the temperature would not be the same as it is in the summer and give the same results. It does not seem so to me and as the doctor likes to be found fault with a little, I just leave that little argument with him.

In regard to adding the starter to the cream when it is about to be churned, I would like to ask Mr. Credicott to answer that question.

The Chairman: Mr. Credicott, will you give us your ideas?

Mr. Credicott: I did not expect to have to say anything on this subject. I came up here as an interested listener. Mr. Hall is giving me more credit than is due me in saying I am the inventor of that method. The method was used, as far as I know, years before by a gentleman by the name of LeClare in the dairy school at Guelph, Ontario. I read about it in the paper several years ago and it was in line with some ideas I had by experimenting in the low ripening of cream with a heavy percentage of starter. I commenced to experiment with this method and I believe I was the first man in the United States who was successful in making butter from sweet unripened cream that would pass in the markets and in the scoring contests with ripened goods, and which no man could tell from the ripened goods. All butter, which is made by this method, when made properly with sufficient starter used to start the development of flavor, will when it is a few days old pass anywhere as ripened cream butter; in fact I do not believe there is a judge living who can tell the difference when that butter is properly made.

There have been a number of failures by men that have tried that method, because they did not understand the process, or did not have proper control of temperatures. It is very simple. All that is necessary is to pasteurize cream properly and add enough starter to develop the desired acid flavor. The flavor of butter as it appeals to me is largely a combination of the sweet creamy flavor which you get from sweet cream and the acid flavor developed by the lactic bacteria, and the ideal butter is the butter which has the largest degree of the sweet creamy flavor with the acid flavor. The more we ripen our cream the more we destroy this sweet creamy flavor. By the sweet cream method we have the sweet creamy flavor of the cream curd in the butter, and by the addition of the starter we develop the desired acid flavor with the

result that we have a combination of the flavor which gives us a rich, delicate, nutty flavor or more properly a sweet cream flavor; and one of the greatest arguments in favor of that method is if you have some poor raw material in the cream it does not give it a chance to spoil the whole vat. Even though the cream be pasteurized very thoroughly, if the bad flavors once start to develop, it seems that they will continue and grow stronger by carrying that cream a few hours at the ripening temperature; but if pasteurized, cooled down immediately, starter added and churned it will have little tendency to contaminate the remainder of the cream, with the result that there is a sweeter, cleaner butter.

This butter, if made from good cream, may be kept from a week to ten days or three weeks before it reaches the highest point of flavor. Buttermakers making butter from that method and getting high scores are churning at least a week or ten days before the butter is to be scored. It becomes better as it becomes older. That is just the reverse of ordinary butter. The high acid butter is at its best when it comes from the churn and begins to deteriorate very quickly, while sweet cream butter improves for sometime and then stays quite a considerable time before it commences to deteriorate, consequently the butter has better keeping qualities and is a good butter to put on the market because it reaches its highest flavor when it gets to the consumer's table, while ordinary ripened butter is on the down grade when it gets to the consumer's table.

That is the outline of the matter as it occurs to me, and I would be glad to answer any questions on the subject.

The Chairman: This is open for general discussion. I feel that it is quite an important subject. We know that much of the cream in the gathered cream plants are taken to the plant and left there for a considerable length of time before it is churned into butter. This covers that. Should that be churned immediately? Is it necessary to supply your starter and leave that cream longer before you churn it? Would it be better if you did not do that? Those are the ideas this question is supposed to cover. We would like to hear from someone in regard to them.

Mr. Smith, Hart: I did some experiment work along this line a year ago in our plant at Hart and in the winter months I had very good results by churning directly from the pasteurizer without giving my cream any time to deteriorate; but as the summer months came on I had to confront an entirely different proposition. I had soft slushy butter, I could not get it cold enough in the summer time to make butter solid and firm. I did not have any success. Last Fall I was in the plant at Coopersville and saw them running their cream directly from the pasteurizer into the churn and adding their starter there. I would like to know by reason of artificial refrigeration whether we can get this cream cool enough from the pasteurizer to harden up those fat globules in order to make them firm or whether it will come slushy. Mr. Rabild happened to come to our town on a particular Saturday night and on Sunday I showed him butter handled in this way, and he said "You are entirely against theory, as theory says you must cool your cream down a certain number of hours and let it stand and harden." That was the theory I was taught but I had broken away from it at that time and had good results in the winter but in the summer I did not.

Mr. Smith: I had some experience last summer. I was in a creamery where we did not have a cream ripener, just a little common vat. I found if I added my starter in the morning, after I got through skimming I had to use an immense amount of ice in the cream to keep it from getting too ripe. I made my starter in the morning at 4 o'clock after putting my ice in the bottom at night, leaving the starter in a half an hour before I churned. I had good results with that method all last summer. I tried to keep the cream as cool as I could until morning.

The Chairman: Did you pasteurize the cream?

Mr. Smith: No, it was not pasteurized.

The Chairman: That does not cover the idea that Mr. Smith brought out because he heated the cream before cooling it.

Mr. Credicott: I have had a great many people report to me in the past four years in regard to their success with this method. I first advocated this method before the Wisconsin Buttermakers convention at Madison four years ago. I was rather ridiculed at that time and for sometime after but enough buttermakers were interested so a number tried it. Some had fine success with this method, while others reported failures but in the majority of cases I believe it was because they did not have proper equipment or did not understand the thorough cooling. I never recommended churning immediately after pasteurization unless it is in the cold weather and unless the cream is cooled continuously from the pasteurizer, so the bulk of the cream in the churn has been cooled for an hour or so and the last cream that goes in there is very quickly cooled. In most of the places where they had trouble from this line they have either been afraid to run the churning temperatures low enough or they have pasteurized and cooled on ordinary cooler and run it into the cream vat and finished cooling and do not get temperatures down until a long time after it had been heated. Where they have artificial refrigeration or facilities to pump ice water or brine through their coils and can cool it continuously, there will be no trouble from this source. I have in the hottest weather in July started my churn fifteen minutes from the time the cream went through the pasteurizer and had butter so hard I had to warm the wash water. I churned at from 46 to 47 degrees. Most buttermakers churn at 50 to 54 degrees. With all pasteurized cream it is necessary to churn two to four degrees colder than raw cream in order to get the same results, and if you are going to churn the cream immediately after pasteurization, churn it sweet if you please, you must have that temperature still lower in order to get exhaustive churning. Some of the buttermakers who are handling hand separator cream, which comes partly sweet and partly sour, believe it is necessary to ripen that cream in order to have the uniform acidity, in order to get clean churning. That can be overcome by having the churning temperature low enough to retard the churning of the cream which has been ripened and hold it back so it can all be done together.

I know it is possible to churn just as clean with cream handled in that way as with ripened cream if your churning temperature is low enough to require at least an hour and a quarter in order to complete the churning. If you have it warmer than that you will have trouble. A short time ago a gentleman from a dairy school in the east told me

he had been trying that method and had poor success with it. I commenced to ask questions and asked how long it took to churn. He said about twenty minutes and that he churned at 50 degrees. He needed a churning temperature of 46 in order to get a good solid body. The buttermakers must remember they are handling something entirely different than the ripened cream proposition. They have got to drop their old churning temperatures and adjust temperatures and conditions to new methods which they are using.

Mr. Gilbert: Have you had any records from that kind of work from cream immediately from the separator where whole milk entirely is used?

Mr. Credicott: Yes, I have seen butter made that way and sometimes it gives very good results, then again in a churning of butter will be away off, and here is the reason for it. When you pasteurize the cream you kill the majority of the bacteria and the percentage of bacteria carried into the butter from a ripened cream that has not been pasteurized has been very small, so if you pasteurize it and churn it the few bacteria left alive make a small percentage in the butter. There is practically nothing to spoil that butter; but if you churn raw cream you have all these bacteria without anything to hold them in check and they are liable to develop old flavors very quickly. If raw material is fine it will give good results but if your raw material is off grade the results will be disappointing. I know of a creamery in Minnesota where the buttermaker sometimes received a very high score on his butter; one month he would get a first class score of 96 or 97 and the next month a score of 89 or 90. When I visited his creamery I found he was churning raw cream in that manner with starter added, and when he happened to get good raw material he got a fine score but if the material was a little off the butter would not keep, so I never advise it with raw material. It is a rather risky proposition. We used to think butter would not keep unless it had acid and that I believe is true of raw cream butter because we have all the bacteria in the cream. The development of acidity in that cream has a tendency to hold this bacteria in check and keep them from development so that the acid cream keeps better; but if you pasteurize and kill those bacteria then there is not the necessity of acid in the butter to give it keeping qualities. In fact in storage it has been found, as the doctor told you in his paper, that the mild low flavored butter keeps the best, while butter with high acid becomes stale and old in flavor.

Mr. Leiber: I would like to ask a question in regard to churning. How much is the difference in loss of butterfat on ripened cream and sweet cream, or is there any difference? Would sweet cream churn as exhaustively as ripened cream?

Mr. Credicott: Just as clean if not cleaner. I believe with proper control of the temperatures it is possible to churn sweet cream cleaner than the raw cream because you churn at the lower temperature. There is no gas in churning with sweet cream. After running the churn a few minutes with ripened cream the buttermaker finds it necessary to let off the gas there. In sweet cream you open the vent and it draws air into the churn and the cream never foams up as it does in ripened cream, consequently you can churn more exhaustively than you can ripened cream.

Member: I would like to ask if churning at such a low temperature will make the butter brittle?

Mr. Credicott: You might find it necessary to warm the wash water in order to temper the butter back to the proper consistency for working. That might not be necessary in the summer but it would be in the winter. Of course it would not be necessary to have as low a temperature in the winter. Where 47 or 48 degrees are necessary in the summer a temperature of 50 to 52 degrees would do in the winter. It is impossible to set down any rules in regard to temperature as two creameries within a few miles of each other may vary a great deal in temperature. I have found under average conditions, a churning requiring an hour to an hour and a quarter will be just right to churn at that temperature. You have to adjust the wash water temperature to get the butter the proper consistency for working.

Mr. Martin: Does the consistency of the cream make any difference?

Would you churn cream testing 20 per cent and cream testing 35 per cent at the same low temperature?

Mr. Credicott: Of course that would make a difference. I was talking of an ideal cream. I consider 30 per cent as the ideal fat percentage to give a good texture to the butter. Higher than that has a tendency to be paste in texture and lower than that gives you trouble in churning. I have churned as low as 20 per cent butterfat but I have found it necessary after the butter broke to allow the churn to set for a few minutes so the butter would come to the top, then draw off part of the buttermilk and complete the churning. In that way you can draw some of the buttermilk from the bottom without losing any of the granules, then you can continue to churn and gather it up, but the thin cream makes a more difficult process. It is easier, however, to churn the thin cream that has been pasteurized than a thin cream that has not been pasteurized.

Mr. Pierce: There has been one other proposition that has confronted the buttermakers in Michigan and that is adding the starter to the butter after starting. I would like to hear from anyone that has tried that method.

The Chairman: Dr. Rahn covered that in his paper. Mr. Credicott will you give your opinion about that?

Mr. Credicott: I would not advise it. I had an opportunity to see considerable butter made that way. Occasionally a shipment of butter shows up very well but in the majority of instances that have come under my observation the butter has had old over-ripe flavor and deteriorates very quickly. You all know if you do not wash your butter sufficiently and leave buttermilk in it that the butter will develop old unclean flavor very quickly, and by working the starter into the butter you are producing the same condition that you would have if you did not wash the butter sufficiently and the result is sure to be a poor keeping quality of butter.

The Chairman: Dr. Rahn, if a high acidity is used you advised the use of skim milk in making the commercial starter rather than whole milk? I would like to know your reason for it.

Dr. Rahn: I have no reason for it.

The Chairman: In this process of buttermaking about which they

are talking, when the pasteurized cream is churned sweet, if you had a commercial starter made from whole milk part of the fat in the milk would be incorporated in the butter and would not this starter produce a little better effect than it would if you had a skim milk starter?

Mr. Rahn: Probably not. Lactic acid bacteria does not seem to have anything to do with the ripening flavor because the fat itself has no flavor.

The Chairman: It must be that the starter causes development in the butter after it is churned.

Dr. Rahn: The lactic acid bacteria are a little different if they are kept away from the air. The air does not get through the whole milk as easily as it would through the skim milk and we have the bacteria in it, so I think that has something to do with it.

The Chairman: My idea was that the starter made from whole milk in which you have a little of the fat of the whole milk in the starter incorporating with the butter after it is churned that that starter would be more effective than a starter made out of skim milk where you have no ripened cream in your starter.

Dr. Rahn: I have no practical experience. All I can say is from my observation.

The Chairman: A creamery using considerable starter would find it paid to skim the milk to make the starter rather than make it from whole milk. Do you think, Mr. Credicott, the unripened fat in the starter has a greater influence on the development of flavor in the butter than if we made the starter out of skim milk?

Mr. Credicott: I do not think it has any effect but the small amount of fat in the milk gives the finished starter a smoother flavor to the palate, but I never have found any practical difference in the flavor produced in the butter between skim milk and whole milk starter. I used whole milk starter most of the time because it is more convenient but if by any chance the starter should go wrong you have to throw away whole milk, while you would be throwing away skim milk in using skim milk starter. The whole milk starter has a tendency to give a more pleasant flavor in the mouth but I doubt if it has any effect on the butter more than skim milk.

Mr. Hall: The makers of the different cultures advise us to skim the top from our starter before we put it in the fat, and if we had a whole milk starter and skim the top off we would not get the butterfat in the starter.

Mr. Ericsson: I do not believe in skimming off the top of the starter before you fix it. I do not consider that at all necessary.

Mr. Wick: Is it more favorable to run starter through the separator and take out the impurities? Would that be of any benefit in using a starter?

Dr. Rahn: Running it through the separator takes out what we see but it does not take out the impurities.

The Chairman: If a hair or piece of dirt got into the milk you might as well leave it there.

Dr. Rahn: May I say one thing for skimming the starter? I have often seen a starter with a mould. This mould is apt to make the butter rancid. The mould is not impure milk and if taken off the top of the starter we may avoid contamination by that mould.



The Chairman: This is a very interesting subject to me at least but time is passing and I think we will have to stop the discussion of this. It is necessary at this time to transpose the order of the program just a little as Mr. Lee has to leave on an early train and for other reasons so I am going to call on Mr. Lee to discuss "Evolution of Creamery Buttermaking." Mr. Lee is in charge of the department of dairy manufacturers of the University of Illinois.

## EVOLUTION OF CREAMERY BUTTERMAKING.

MR. CARL E. LEE, U. OF I., URBANA, ILL.

Mr. Chairman, and Members of the Michigan Dairymen's Association:

I wish to thank you and your secretary for the honor you have conferred upon me, in requesting that I come to your state to deliver an address on the subject of "Evolution of Creamery Buttermaking." I hesitated a little in accepting, fearing that you expected a comprehensive review of the past; when we have many important issues of the present. Never having had an opportunity of speaking in your state before, I decided to discuss the recent changes and methods of interest to us. And if these will be of some value to the creamery operators of Michigan, I shall feel that my time has been well spent and my labor highly recompensed.

Pardon me if I use as a partial guide my personal observations and experiences, extending over a period of four years as a buttermaker in a centralizing plant; then as a field instructor, and later the four years work in my present position.

The work of a creamery buttermaker is a profession. No one should decide to follow it unless he puts into it as much preparation, thought and skill as is needed by any man who decides to take up a certain line of professional work. Never should it be taken up as a pastime, nor for one's health. It was never intended for either. A special aptness for the work is necessary to the success of a buttermaker. We must have the faculty of knowing when a thing should be done and have the inclination to do it at the right time. The old maxim which reads, "Never leave until tomorrow what can be done today," is intended for him.

Two things that should be uppermost in the mind of every buttermaker are "Progress" and "Development." Without these he can never truly be called a leader in his chosen profession.

Let us give all honor to the veterans and pioneers of buttermaking. Nevertheless the men of the present day, who are at the wheel of the creamery industry live and work under different environment, circumstances and conditions. The buttermaker must not be satisfied with what he has done in the past, nor yet upon his reputation, backed up by years of hard work in the churn room. Perhaps he was so fortunate at one time as to carry home the "Blue Ribbon." Such honors all count but if he cannot do it again and again it must have been guess work or

an accident. It may be that once in a while a man, having all the qualities of a good buttermaker will fail. Let me say here that such a man can find real comfort in the words of Dunbar.

"For its fine to go up, and the world's applause  
Is sweet to the mortal ear;  
But the man who fails in a noble cause,  
Is a hero that's no less 'dear.'"

No other industry means quite so much to the state as her dairy and creamery work. First, because it bears a direct relation to the fertility of her soils. Second, improvement of her stock. Third, a continuous source of income to a large class of people, rightly called the backbone of the state. Fourth, it gives to her vast population food products which, if properly handled and cared for, stand second to none. If you do not believe me take a good look at the next country boy or girl you see, who has had the advantage of all these things.

Let us take a look at two creameries, which I call to mind, situated in the same locality. Condition as nearly alike as they could be made. Each has a chance to sell their product in the same market, to the same consumer. Both creameries managed by men of equal ability. All milk producers taking the same interest in the welfare and success of their own institution. Yet in view of all these facts, one creamery stands today as a splendid example of success and the other as almost a total failure. You ask the reason for all this. It is fair, I think, to say that there is something in the buttermaker as a man and the methods he employs. If comparing two cows we would say: "One is a scrub." It is true that all buttermakers are not constituted alike, nor have they had an equal chance in preparing for their work. And, even if they had had equal opportunities it could not safely be said that in the outcome they would tie. All great industries start with a small beginning and gradually climb up step by step. Methods and the general system of doing creamery work change. They are not the same today that they were ten or fifteen years ago. This is natural. We have had to change to meet the gradual progress. We all realize that a great deal is said today regarding the quality of the American butter. I was much surprised on hearing only a short time ago, that less than three-fifths of the butter that reached Chicago, was fit for table use. If such is the case with all the present educational force at work for the betterment of our manufactured dairy products, we must ask ourselves, if the industry is really on the decline. If so what can I do as a creamery buttermaker to turn the tide? Another question might also be asked. Is our butter really declining in quality, or has the public developed a keener sense of taste and are they demanding a better product? Doubtless both are true.

For a moment let us consider our relation to the butter consumer. by them the one thing demanded is quality. The butter must satisfy this demand. I fully believe that three-fourths of the butter consumers really know what they want. Mrs. Jones, buys her butter of Smith's Grocery Co. They have always delivered to her house Michigan's sweet Clover Creamery. To Mrs. Smith the butter has not for sometime been what she desires, but she hesitates in making a complaint because of

the reputation that this butter has held for years. An opportune time comes and she tells the Grocery Co. about it, and she ends by saying, "I must have better butter on my table." Come to find out she is not the only dissatisfied customer. Complaints increase until finally that Grocery Co. notifies the Commission Firm that a change must be made. They reply that the butter has always had a fine reputation for quality. That the company manufacturing the butter has the finest and best equipped creamery in the state. What does this and similar cases signify? Misplaced confidence and the living on past reputation for quality and equipment.

The consuming public does not care about the commercial name and reputation. They are not concerned with the place of manufacture. They ask that the butter be sanitary and good enough for table use. No creamery company can afford to make good butter this week and poor butter the next. It will never do. Uniformity always pays. The commission firm or official butter judge may be able to give an absolute score on a creamery company's butter. They can, in a measure, tell what is the matter with the butter and offer suggestions for its improvement. In a general way their intentions are all right. But if the man, calling himself a buttermaker, is not able to tell whether his butter is or is not of passing grade, he is not broad enough to comprehend or follow the outline for improvement. Accidents are always overlooked. In reading our papers, carefully going over addresses, the general blame for poor quality of butter is placed at the door of the milk and cream producer. Let them have their share of it. Butter that happens to have an old, stale, cream flavor is, as a rule, criticised as being made from "old, stale, milk and cream." That is all right when it is true. But when we know that the same off-flavor can be developed in the cream after it is in the cream ripener, is it not fair that the blame should be placed upon the man in charge of that work and not the farmer?

There are other causes for poor butter, and the blame has often been misplaced. When the creamery buttermaker has something that he thinks he can use as a shield and it is accepted as such he has in a measure put a check upon his advancement.

I must not get too far away from my subject. It cannot be said that there has been a radical change in our system of manufacturing butter. There has been a gradual change. This subject can be discussed from many view points. There has been no change in the demand for quality in milk and cream. There is a direct relationship between quality of the raw material and the finished product. Flavor once destroyed can not be restored. All that can be claimed is that it can be diluted or doctored without any noticeable relief. It is true that two grades of butter can be made out of the same grade of cream, by employing slightly different methods of handling. After the cream is in charge of the buttermaker he should handle it in such a manner that the best possible butter is made from that cream.

A liberal amount of starter should be used because there is not another thing at his disposal which will give such beneficial results. Time will not permit me to go into the making of starters. Even if I did I could not add anything to what has already been written and said

upon the subject. Our creamery operators today, handling hand separator skimmed cream should not make a single churning of butter unless a large amount of starter or clean-flavored milk had been added to that cream.

To the man fortunate enough to be running a whole milk creamery, I cannot give any new advice as to when cream should be churned, because we have done no experimental work at our station along that line. This work has been carried on by Rodgers of the U. S. Dairy Division and Professor Dean of Canada.

Others have given their opinions and ideas on this subject but their results were not obtained by using cream that was comparable or obtained under experimental conditions. They drew their conclusions from creamery work. The making of butter one year, one month or one day by a certain method and then changing the method slightly for a like period for comparison is not going to give results that are facts, because the lots of cream are not comparable. For comparison, everything must be as nearly under the same conditions as circumstances will permit; except for the one thing that is changed. For example, churning cream with 2-10 per cent acid as compared with cream containing 5-10 per cent acid, the same cream must be used, differing only in per cent of acid developed. We have always held that the cream should not be allowed to develop over 5-10 per cent acid before it is cooled to churning temperature. There is nothing gained by allowing the cream to stand at that temperature any longer that is required to produce the desired effect upon the butterfat, which bears a direct relation to firmness of the granular butter. This time is governed by churning temperature and the operator must use his judgment. One of the late developments of the creamery industry is the farm separator. This has made a great change in creamery work. It is more complex and calls for better men to do the work. The man who understood the whole milk system is at a loss when he encounters the hand separator problem.

The boys handling the hand separator cream must observe the following. Handle and treat the cream in such a manner as will get it into the best possible condition for churning. Cool it at once to the desired temperature, or a temperature sufficiently low to check fermentation. This thing cannot be safely regulated by hours. The amount of work that a man has to do and conditions under which he is working must be taken into consideration. If the cream cannot be churned in two hours after it has been cooled, do the next best thing. There should be a little more uniformity in this work, not only in this one thing but in the whole system of creamery operation.

In July of last year, the manager of a centralizing plant made this statement to me. "Mr. Blank advised us to hold our hand separator cream for 48 hours after it was delivered. Now what is your idea?" Naturally we had a free discussion of the whole matter.

During the summer of 1907, we compared butter made from cream held from 1½ to 2 hours with butter made from cream held from 12 to 14 hours after cooling it before it was churned. In all 100 tubs were packed representing the two lots of butter. These tubs were representative of nearly all the butter made for a period of six weeks.

The cream was cooled each day in one vat. Half of it was taken out and the balance cooled still lower or a temperature low enough to allow for the increase of temperature which would naturally take place in from 10 to 12 hours. The 100 tubs were all scored in July by five different judges and were again scored in December, when the averages of all the scores placed upon the butter were tabulated; showing that the quality were the same for both lots. Pasteurization and its relation to quality has called forth considerable discussion in recent years. Much that has been written is without experimental foundation. Pasteurization from a sanitary aspect should be practiced and encouraged. Yes, even be made compulsory. The word pasteurization, when applied to dairy products does not mean anything unless it is thoroughly done, thereby destroying disease-producing germs.

The result of our series of experiments on pasteurization of hand separator cream and its effect upon the quality of the finished product, will shortly be issued in Bulletin form. The cream for all of our work was pasteurized by the continuous method and heated to a temperature, ranging from 160 to 180° F. The latter temperature is preferable. Since a review of the changes in buttermaking would be of no educational value, I prefer to give some practical methods, some of which I hope may be applied. There are two main factors which must be considered in churning the cream; namely, temperature and size of granules. You may ask why the size of the granules is of such importance. Butter granules of the proper size will allow the drainage of buttermilk with the least difficulty. Over-churning, either in the buttermilk or wash water should never be permitted. It is practiced by a few who claim that it is one of the methods for controlling the water content of the butter. If it will control the water content where is the proof that it accomplished the desired effect, or produces anything that cannot be accomplished by other methods less dangerous to the body of the butter.

The temperature employed during the whole process, from churning until the finished product is in its marketable package, must be thoroughly understood by everyone who handles a churn. Temperature is the one factor that counts in the workmanship of butter. Temperature bears a direct relationship to body or texture, uniformity of color and salt, and the amount of visible and actual water content. Example. Butter containing from 80 to 82 per cent of fat or any desired per cent of fat within reasonable limits, can be made by controlling temperature conditions throughout. Degree of acidity, ripeness of the cream, size of granules or amount of cream in the churn, etc. bear an insignificant relation. But it is absolutely necessary that the temperature of the cream, wash water and butter be correct.

In churning the cream it is not safe to say what temperature shall be employed. It varies with the season of the year and several other conditions. The one thing to be used as a guide is the granular butter. It should not be so soft that the granules cannot be kept in their natural form, nor so firm that they must be warmed up before the butter is worked. This does not mean that the temperature of the cream when it is churned, must be 50 or 52°. It would be better if it were uniform and fairly constant, with an extreme variation of from four to

six degrees in churning temperature between summer and winter. There is no excuse whatever for churning at 50° one day and at 56° the next.

The buttermilk must be allowed to drain off. Sprinkle a small amount of water, over the butter. Allow this water to drain off. Wash the butter once in about the same amount of water as there was buttermilk, at nearly the same temperature, revolving the churn say 10 times or more on fast gear. While the last of the wash water is running off sprinkle the salt on the butter, and then moisten the salt with a known quantity of water.

Our Field man suggests the following plan for his work in the creameries of our state. Mix a known quantity of salt and water in a can and then add it to the butter in the churn. The salt and water can be mixed a number of hours before it is to be used. In that case use hot water and cool it. A solution of from 8 to 10 pounds of salt and 10 pounds of water per 100 pounds of butter is safe for a trial churning or, 12 pounds of salt and 16 to 18 pounds of water, etc. After the salt and water have been added to the churn, everything must be closed tight and left so until the butter has been worked. In starting the working of the butter, revolve the churn a few times on slow gear without working. When actual working has commenced it must be continuous until the product is finished. I trust there is not a butter-maker in the state of Michigan that follows the old practice of working the butter a few revolutions then stopping the churn with cover down to allow water to drain off and so on until worked. I have myself been guilty of giving that instruction because it was the method generally used. It is condemned because it removes the free water absolutely necessary for dissolving the salt. It allows the butter to become firm and then to soften again when worked. It lowers the moisture content of the finished product from what it would have been if the butter had been worked by the continuous method. There should be no time lost between the drawing of the buttermilk and working of the butter and this is one of the essential things in making a well-finished product. It is difficult to state just how the butter should be handled in working. Here is where we must depend upon the buttermaker's judgment. The butter must not be over or under worked. If the salt has been moistened or a sufficient amount of water is present in the churn when the butter is worked there is little danger of undissolved salt after the butter is half worked. The moistening of the salt or working the butter in the presence of known weight of water reduces if not entirely overcomes the danger of mottled butter. It also helps to regulate the per cent of salt left in the worked butter. The per cent of salt in butter is regulated by the amount of salt added to the quantity of butter and water in the churn. There seems to be less danger of injuring the body of the butter if excessive working is done in the presence of water. The presence of surplus water alone does not have any tendency to increase the water content, providing the other details of the churning operations have been carefully watched.

Probably the greatest step of recent years in the evolution in creamery buttermaking has been fixing the limit of water content. The study of water and the control of the general composition of butter has led to a more thorough understanding of the influencing factors, on the part of the buttermakers.

Butter made from day to day by the same method will give a product of uniform composition. The variation is caused by a sampling error. The term sampling error in this case means that the result obtained in analysing one sample is not going to give the true composition of all of the butter in the churn or tub. It will probably come within one per cent of the actual fat and water content. In other words, 10 samples of butter taken from either end or middle of the churn will vary. The same fact will hold true if the 10 samples were all taken from one part of the churn, 10 different tubs or the same number of prints, packed from one particular churning of butter.

The variation of three or four per cent in either the water or fat content of properly made butter from different churnings out of the same vat of cream is not going to effect the flavor of the butter. Will it effect the net returns to the factory? I am safe in making the statement that the average fat content of the Michigan butter made during the month of February, this year, is in the neighborhood of 83 per cent. Should some sudden change be introduced in the general method of making butter so as to reduce the fat or increase the water content two per cent, it would not be noticed by the consumer. If the buttermaker is making butter that gives splendid satisfaction, everything uniform, and no great variation in the salt and water content, then the fat content is bound to be uniform because the other constituents; casein, ash, etc., do not vary much form one per cent. Granting that this fat content is a little higher than necessary it would not be advisable to change unless quality could still be maintained.

It is a deplorable fact that there is such a variation in composition of butter from various factories or from the same factory. There is no need of this. But as long as the makers do not pay more attention to details it will continue to remain so.

Set your standard for composition at from 14 to 15 per cent of water, 81 to 83 per cent of fat, two to three per cent of salt, and the butter will meet the requirements of the American markets.

Take the samples for water and fat analysis by removing a trier full of butter extending the full depth of the tub, or tubs, and mixing in one sample jar. In removing the butter from the trier do not lose any of the water adhering to the outside of the butter. Replace the top two inches of butter on the trier in the hole left in the tub. I have already asked the question. "Does the composition of butter give an absolute basis for computation of net returns to the factory. No doubt you expect me to say that it does, but not so.

The fat content of the butter made for a certain day is a guide to what the actual overrun might have been, but no one should use it as the basis for actual overrun. Actual overrun is based upon the total number of pounds of butterfat paid for and butter sold. It is not fair to say, "My butter contains 80 per cent of fat, therefore my overrun should be 25 per cent." The known per cent of fat in the butter may not be absolute. 100 pounds of fat bought in milk or cream can not be made up into butter without a loss, and the per cent lost will vary, but naturally should keep within reasonable limits. 3d. It is not to be expected that 1,000 pounds of butter packed in 60 pound tubs will reach the dealer and get returns for 1,000 pounds. 4th. The testing of

milk and cream is not done so accurately that 100 pounds of butterfat by one lot of tests would not be represented as either 99 or 101 pounds of fat, should a second test be made of the same samples of milk or cream.

All these facts taken into consideration bear a direct relation to the success of any factory and in part can be called the sum total of Mechanical loss. We cannot say what this loss shall be. However, we do know that in the paying for 100 pounds of fat, only 97 to 99 pounds of it is sold in the butter. This loss is in skim milk and buttermilk for a whole-milk factory and in buttermilk where nothing but hand separator cream is handled. A slight loss of cream and butter, a natural shrinkage in the weight of the butter. The two great influencing factors that regulate the overrun, are a low mechanical loss of butterfat and accuracy in the operation of the Babcock test. And as a minor factor the fat content of the butter.

Two creameries making butter containing 82 per cent of fat; the mechanical loss in both factories is 2 per cent; one of these factories reports an overrun of 19.5 per cent and the other one 25 per cent. Wherein is the difference. One man paid for the actual butterfat delivered and the other one either accidentally paid for less fat than delivered or else did not consider his conscience in operating the Babcock test.

No man can test the butter for moisture alone and use that as a basis for figuring his overrun. It is incorrect to say that the butter contains 15 per cent water; therefore the salt must be 4 per cent, the casein, ash, etc. 4 per cent, making a total of 23; 100-23 is 77, which represents the fat in the butter. The average casein content of our butter is close to 1 per cent and if the salt is 4 per cent the butter will only sell to special consumers. Every creamery operator should find out the fat content of his butter. It can be done by the Babcock test, just as accurately as testing a sample of cream, containing 60 per cent butterfat.

If perchance the overrun for a certain factory for the month of January was 18 per cent and that was all the overrun that the per cent of fat in the butter would permit allowing for a very low mechanical loss. The manager of the factory wanted a 20 per cent overrun in order that a loss might not be figured against the factory. Let me say that the only legitimate method by which this extra overrun can be obtained would be to lower the per cent of fat in the actual butter sold.

Buttermakers and creamerymen of Michigan, you are largely responsible for the future interest in dairying and the quality of the butter made within your state. An intelligent application of the facts already known can not help but bring results. Remember that there is no vocation more honorable than laboring for the improvement of this industry, in which you are so interested.

#### DISCUSSION.

Mr. Burns: Was one lot pasteurized and the other not?

Mr. Lee: Yes, one was pasteurized and the other not, but both were handled just the same. I can give you this general idea of pasteuriza-



tion that if I should ship two tubs of butter from the same churning and present it to a judge he would probably vary just as much on those two tubs as he would on two tubs, one being pasteurized and the other raw. The average per cent of acidity on the cream was between 4 per cent and 5 per cent.

Mr. Burns: You do not think there is any great benefit in pasteurizing?

Mr. Lee: I do not want to say I think not but the work we have done on that covers a period of four years. The bulletin will be out in three or four months. We have divided two vats of cream, from one vat making pasteurized butter and from the other unpasteurized butter, sent the butter directly from our creamery to the cold storage and had each lot scored separately by five judges, and we never found there was any difference between the pasteurized and the unpasteurized butter.

When I came to Illinois to take up the field work my idea was to give the creamerymen in the state of Illinois the best advice I could give them. There were several small creamery operators who came to me and said "We have been thinking of putting in a pasteurizer. Will you assure us that our butter is going to give better satisfaction when it is sold to the commission merchant when pasteurized than when not pasteurized?" Being as a rule conservative I simply said "I don't know, but my opinion is that pasteurization improves the quality of butter. I want you to understand that is my opinion but I have no facts to prove it and I cannot find any facts that prove that pasteurization improves the quality of butter." We have lots of opinions and theories. Then we started on that work to see what we could do. I have not changed my opinion as far as I am concerned. I always considered that pasteurized goods were better but when I submitted the two kinds of butter to the judges on the market they could not tell the difference.

Mr. Olson: Does pasteurization help poor butter?

Mr. Lee: One time I went into a creamery in Illinois. I took 12 vats of cream. Most of that cream was delivered once a week and a lot of it came so gassy we could hardly handle it. We ran all the cream into one vat, then divided it into two portions, pasteurizing one portion and not pasteurizing the other, and the judges could not tell the difference in the butter. I do not think you can take a spoiled piece of meat or rotten apple and by boiling it make anybody eat it. A lot of people advocate pasteurizing because they want to cover a multitude of sins. I believe in pasteurization from a sanitary standpoint when it is done right but I do not believe in broadcast advocating of a thing on opinions. What the buttermakers want are facts. I had a college man say to me a short time ago, "It will not do for you to publish the results you have on pasteurization. They will not have any faith in the system of judging butter." We know that judging butter is done by men that are conscientious. It is like a man looking at two cows, he may say, "This is the better cow," but how are we going to find out? It is simply a matter of opinion.

Mr. Smith: I worked in a big creamery in Topeka where we received cream day and night. We pasteurized all the cream, cooled it and

then churned it. It would not be over two hours after it was brought in until it was churned and made into butter, and some of that cream was very bad. Would not that be a benefit?

Mr. Lee: That is what I would do myself if I were running a factory. We are doing that at the University of Illinois. I want to say in connection with that, I never advocate publicly the churning of cream as soon as possible after having it cooled, unless the man uses his judgment in connection with that. I would not say it is a benefit, really I cannot see that anything can be gained by holding it. If cream is handled properly and cooled low enough the comparison in holding cream from one and one-half to two hours and fourteen hours, we find no difference. If I were handling hand separator cream I would get it into condition for churning as soon as possible after I got it in and if I could arrange my work so as to churn it then I would do so, but if I told a creamery man to do that he might make a failure because he would not have the temperatures.

Mr. Smith: Do you pasteurize?

Mr. Lee: Yes, because of the sanitary effect it has on the butter. We know at the University creamery that we are taking in milk from tubercular cows so every pound of butter that goes out from our creamery, except for experimental purposes, is pasteurized.

Mr. Credicott: One thing I would like to have you emphasize, and that is when you hold cream over night you have to cool it.

Mr. Lee: Yes, when you hold the cream over night, bring it down low enough the night before so it is ripe the next morning. Where the buttermakers make the mistake, if they find the cream 58 in the morning and they want it at 52, they throw in a lot of ice and then churn it. That is not the way to do, cool it the night before.

Member: We live out in the country and we make our own butter, using the balance of the milk. My wife keeps the cream at as low a temperature as she can. Sometimes it will come up in fifteen minutes and sometimes we cannot get butter at all. I have to churn it.

Mr. Lee: Let me answer that in this way. A short time ago I was talking to 300 farmers and their wives at one of the big institutes in Illinois. I made a statement regarding butter and one old farmer got up and said "We have always made good butter on our farm. I always feed my cows on timothy hay." That does not answer your question. I cannot answer that question of yours. There are some things there that are beyond our control. If you handled the cream identically the same there might be some condition of the cow that effects the churning of the cream. We find when we churn cream skimmed from milk from a herd of cows rather than churning from one cow.

Member: Do you think it is a needless expense to pasteurize cream to improve the quality of the butter?

Mr. Lee: My personal opinion is you can improve it but when you place the butter on the market and put five judges on 360 tubs of butter, as we did this year, they do not know one from the other. All our cream was pasteurized to a temperature of 180, and it was what we considered an average quality of cream. If I were to start a factory in Michigan if I could only make 100 pounds of butter as compared with 200 pounds, if that 100 pounds were good I would not care for the

other 100 pounds. The farmers will come your way when they find out they cannot deliver a rotten stuff. It annoys me to hear fellows say "The cream is so bad we cannot make it into butter." Do not take it, let the other fellow have it. Do not blame the centralizer, the other fellow is just as bad. I know of two proprietors in Illinois, running two small creameries, one fellow taking a lot of rotten cream, handing it over to a dray line to be delivered to the other creamery, and the other man is playing the same trick on him. Don't do it.

Member: If you do that you might as well shut up.

Mr. Lee: I think the creamery men could get together and agree on some system. It is because we are too selfish.

Mr. Haven: What is the cost of pasteurization per pound?

Mr. Lee: I cannot give you the exact figures, they are pretty hard to get at, because when you pasteurize sometimes you have to use more coal than if you did not pasteurize, because the cream was late in getting in in the afternoon. It is estimated that the cost is close to one cent a pound.

Mr. Burns: In this experimental work was the cream gathered in the summer or in the winter?

Mr. Lee: The butter was made in May, June, July, August and Sept., so it was practically summer cream. We have no results on winter cream.

Mr. Lokker: We know the hardships creameries had to contend with a few years ago. Sometimes a creamery was built where there was no place for it. In this last year I know of a few creameries that had a pretty hard time, and I think it is due somewhat to the hand separator cream they have taken in. The question I want to bring out is this, some of those creameries have taken this hand separator cream, tested it and added approximately seven per cent to the test, and then pay the same as for whole milk. My question is could the creameries afford to do that?

Mr. Lee: Certainly they could not afford to do that. That is speaking off hand. There might be some other conditions of which I do not know.

Mr. Moore: Is not the gentlemen speaking of 11 per cent and not three per cent difference?

Mr. Lee: I do not believe in adding anything to the test of cream. In buying hand separator cream and whole milk fat I believe in paying more for the whole milk fat than for the separator cream because it is worth more to make into butter. Theoretically that is not so.

Mr. Burns: What is the best way to put in the salt?

Mr. Lee: We have a certain method of making butter in Illinois that has nothing new in it at all. It was advocated a long time ago. We have considered it very important and I was surprised today in looking over the butter here to find so much mottled butter, actually if it was made by Illinois boys I would be ashamed of it. Now do not misunderstand me. The reason that you have so much mottled butter here is because the boys do not thoroughly understand the handling of butter in the churn. I have sometimes said one half the battle for quality is won or lost after the butter is in the churn and if the man fails in getting results he blames the farmer. You cannot expect to make butter free

from mottles unless you have enough water in the churn to dissolve the salt and no amount of working without the presence of moisture will dissolve the salt. With our method of working, we can take the butter out of the churn when it is half worked and it will not be mottled because the salt is dissolved. When a man pulls out a trier of butter and it is spotted like a Holstein cow, he says "That is not good butter." Mr. Credicott will tell you how they will score that on the Chicago market. It is one of the objectionable defects in butter and bear this in mind, if any of you are interested, whatever you do be sure that you have a certain amount of moisture in the churn when you work the butter, and I hope there is not a Michigan man today using the old method of making butter, where he makes butter by lifting the gear on the open lever and allowing the water to drain out. I taught that method when I did not know any better. Some of you may not agree with me when I say you must have a certain amount of moisture in the churn to dissolve your salt. I do not care if you do not agree with me. You do not have to follow any man's advice, but I believe this to be true. Take the facts as we already have them and adapt them to your own conditions and you will get a result that will be satisfactory.

The Chairman: We have not time before it will be necessary to stop for election of officers to take up the next paper. We have a little addition to the program to which I want to call your attention at this time. Mr. Shilling, President of the National Dairy Union, is here. That is the organization which has done such splendid work in the fight it carried on a few years ago against the oleomargarine interests. You know that the oleomargarine people have thrown down the gauntlet again and we are to have another fight. Mr Shilling will just take a few minutes of your time to say a few words about his position. I have pleasure in introducing Sam Shilling, of Chicago.

### ADDRESS.

MR. S. B. SHILLING, PREST. NAT'L DAIRY UNION, CHICAGO.

Mr. Chairman, Ladies and Gentlemen:

I am glad your president introduced me as Sam Shilling, it sounds natural. I am only going to take a few minutes of your time but I do feel that the subject about which I want to speak to you is of such importance to you that I can intrude upon your generosity for a few minutes.

Your president has told you the gauntlet has been thrown down and I want to say it is, in this way. Two weeks ago last Tuesday Senator Burlson, of Texas, introduced a bill in the House of Representatives asking for a repeal of our present oleomargarine law. Now I have to tell you that this is a plan formed long ago that is being carried out at the present time and in the first round of that battle the dairymen have suffered defeat.

While the measure did not come exactly from where we supposed it would, it came from a man always thought of highly in that organization, which shows that they are fully alive to the importance of having a good man in the House introduce that bill, so they chose a most popular man, probably the most popular in the House of Representatives, from the Southern district, which is so much interested in the repeal of that law. That bill was framed by him and the first trouble was over to which committee it should be referred. Our Senator Tawney, who has had the matter in charge for the dairymen, fought to have this referred to the agricultural committee. Had it been taken there we would have had some show of success in the bill not being reported out or of being buried there, but Mr. Tawney and the dairymen were unsuccessful and the matter was referred to the Ways and Means committee, which we know is antagonistic to the dairymen's interests. This means that the bill, when it does come up again, is going to be reported out favorably for passage.

As we understand the matter at the present time, there is no intention of voting on this bill at this session; in fact I received a letter from Senator Tawney before I left the office today and he said with the committee busied with the new tariff bill there was no show to consider this matter at this session of Congress, and there will be nothing done at the special session which will be called immediately after the adjournment of this, but it seems to us it is the plan of the backers of this bill to bring it up for passage at the long session. I simply give you this to tell you the conditions as they exist at the present time.

This is the third bill asking for the repeal of the law since we have had it passed. These other bills have been in a measure spasmodic with no backing and have attracted very little attention, but I want to say to you that the present measure is not a spasmodic effort by any means. It has backing and for the first time an organized movement is on foot to secure a repeal of our law. You can go into your stores right here in Grand Rapids and you will find a petition there asking for a repeal of our law, and you will be asked to sign it. The National Retail Grocers' Association has adopted a resolution of that kind. Nearly every State Grocers Association has done the same thing and when the national convention meets again it will undoubtedly reiterate it.

I simply give you the facts in the case and I want to say it is only going to be by the most earnest work and our combining together that we are going to prevent a repeal of that law. The time allowed me is nearly over, but I have one more thing to say to you. I have an object lesson here. I am holding in my hand a package of oleomargarine, similar to that which is being placed on the market today in the larger cities of the country, and I want every buttermaker in this audience before he goes away from here to examine this product. I want you to examine the color and I want to say to you that the color which it has is as deep as the New York market will accept without objection, is as deep as perhaps a great many of you are making in your butter, and this is put on the market under the quarter cent tax with the guarantee that it contains no artificial coloration. I have not time to go into that in detail but I want you to examine it carefully because I want the buttermakers of Michigan to know what they have to contend with.

Now I am not going to find fault with you. I feel a great deal more like finding fault with the last man that spoke when he said he was "tired of hearing the cry of receiving poor cream in the creameries." I believe he does not know the conditions which you have to contend with or he would not have said that.

I thank you for the opportunity of standing before you this long. After the meeting adjourns I will leave this piece of oleomargarine in some place where you can see it. I thank you for your attention.

### ELECTION OF OFFICERS.

The Chairman: The time has arrived for the election of officers. Under the modified by-laws which we adopted last evening we are to nominate by ballot and elect by ballot. This is the first time we have had to do that in this association. It will probably take some little time but we will have to be patient. Under our by-laws, you simply vote for whoever you wish for each office, and the three receiving the highest number of ballots are declared nominated. Then you will have to ballot again for those three candidates to elect an officer.

The first in order is the election of president. I suppose it would be in order if someone would make a motion to have tellers appointed to see that this balloting is properly done.

On motion, duly seconded and carried, the directors of the association were appointed to act as tellers.

The Chairman: You will now prepare your nominating ballots for president.

During the preparation and collection of ballots, Miss Jones of New York, favored the audience with a piano solo and also a reading.

The nominating ballots for president being counted by the tellers, the result was as follows:

T. F. Marston, Bay City.....	167
Colon C. Lillie, Coopersville.....	20
E. A. Blakeslee, Galien.....	12

On motion, duly seconded and passed, the secretary was instructed to cast the ballot of the convention for Mr. Marston for president, and this being done Mr. Marston was declared elected.

The Chairman: You will now prepare your nominating ballots for vice-president.

The result of the balloting for vice-president was two candidates, Messrs. Freeman and Vandenboom.

Mr. Blakeslee: I hope Mr. Freeman will be placed on our Board of Directors. He is a business man.

Mr. Haven: I move that the rules be suspended and the secretary cast the vote of the convention for Mr. Vandendboom for vice-president.

Motion seconded and carried, and the vote was so cast. Mr. Vandendboom was declared elected vice-president.

The Chairman: You will now prepare your ballots for the nomination of secretary and treasurer.

While the ballots were being collected, Mr. Gregory introduced the following resolution:

Appreciating that the past four years have been unparalleled to date in the remarkable progress of the Dairymen's Association, and realizing that this progress is in no small degree due to the unselfish efforts of our retiring president, Therefore be it

*Resolved:* That we extend to him a vote of thanks as a slight token of our appreciation of that fact.

Mr. Lillie: I have always worked for what I considered the best interests of the association and I am glad and proud of the fact that the dairymen's association has prospered during the last few years. I have not done any more than I should have done and, as I say, I have enjoyed his work but I felt that it was time to turn it over to another. I know Mr. Marston will give it his best efforts and will make it as great a success as it was in the past. I thank you very much for your expression of appreciation.

We will now listen to the result of the nominating ballots.

There were 202 votes cast, of which S. J. Wilson received 135, W. H. Bechtel 67.

Mr. Breck: I move that the rules be suspended and that the president cast the vote of the convention for Mr. Wilson for secretary and treasurer.

The motion was supported by many voices.

The Chairman: Do I hear any objections?

A voice: Yes let us ballot again.

The Chairman: There being an objection you will prepare your ballots for election.

The result of the elective ballots was, 222 votes cast, of which S. J. Wilson received 148 and W. H. Bechtel 72, and Mr. Wilson was declared elected Secretary-Treasurer for the ensuing year.

Mr. Blakeslee: I see the audience is getting uneasy, therefore I move that the rules be suspended and Mr. Leonard Freeman, of Fenton, be elected chairman of the Board of Directors.

Mr. Raven: I support the motion.

Motion unanimously carried.

On motions, duly seconded and carried, the following gentlemen were also declared elected to act as directors, for the ensuing year:

W. F. Raven.....	Brooklyn.
Ira O. Johnson.....	Detroit.
H. Rozema .....	Fremont.
Chas. R. Webb.....	Chesaning.

The meeting thereupon adjourned.

## THURSDAY EVENING SESSION.

5TH ANNUAL LUNCHEON  
given to the  
MICHIGAN DAIRYMEN'S ASSOCIATION  
by the  
SUPPLY AND BUTTER MEN  
CODY HOTEL  
Grand Rapids, Mich.  
1909

---

## LUNCHEON

Radishes  
Celery

COLD ROAST BEEF

COLD BOILED HAM

COLD BOILED TONGUE

ESCALLOPED POTATOES

Bread and Butter

---

CLARET PUNCH

---

CABBAGE SALAD

American Cheese

Crackers

DOUGHNUTS

Coffee

---

Toastmaster  
MR. S. B. SHILLING,  
Chicago.



## SUPPLY AND BUTTER MEN.

- A. H. Barber Creamery Supply Co.—A. L. Covill, E. A. Smith.  
 F. C. Barger & Co.—F. C. Barger.  
 F. E. Boehmcke & Co.—F. E. Boehmcke.  
 W. R. Brice & Co.—W. J. Kane.  
 Burnap Building & Supply Co.—J. D. Lyon, N. D. Kimball.  
 Cleveland Cream Separator Co.—A. H. Bolter, D. B. Birdsell.  
 Colonial Salt Co.—“Dick” Warner.  
 Corn Products Refining Co.—J. E. Bartlett, W. I. Ziegler.  
 Coyne Bros.—R. J. Coyne, Fred Bockleman.  
 Creamery Package Manufacturing Co.—A. McComb, C. J. W. Smith,  
 J. H. Ladd.  
 DeLaval Separator Co.—H. C. Timmerman, Chas. F. Richards, C. F.  
 Cooper, E. L. Mills, Jos. Gibson.  
 Isaac W. Davis Co.—Arthur C. Abele.  
 Diamond Crystal Salt Co.—J. B. Hill, C. C. Benson.  
 Empire Cream Separator Co.—F. D. Lake, F. M. Chamberlain, M. J.  
 Concklin.  
 Farmers’ Handy Wagon Co.—Shipley Stewart, S. S. Rosenberger,  
 Frank Overton.  
 Fitch, Cornell & Co.—Porter Fitch.  
 Fox River Butter Co.—J. G. Moore.  
 Great Western Cereal Co.—L. R. Hawley.  
 Chris Hansen Laboratory.—Martin H. Meyer.  
 F. E. & W. L. Hodge—F. E. Hodge, W. L. Hodge.  
 Hunter, Walton & Co.—T. A. Somerville, E. N. Bates, G. E. Jenks.  
 International Harvester Co.—Chas. V. Marker, N. H. Graham, M. H.  
 Steiner.  
 Iowa Dairy Separator Co.—C. A. Miller, Geo. I. Gargett, A. E. Lion-  
 bard.  
 Jersey Cattle & Dried Beet Pulp—T. F. Marston.  
 Ladd Brothers—John W. Ladd, J. C. Miller, Jr., G. J. Pullin.  
 Geo. W. Linn & Son—Geo. R. Linn.  
 Merchants’ Despatch Dairy Lines—Thos. Hill.  
 National Creamery Supply Co.—M. A. Cushman, A. H. Compton, R.  
 J. Ellwanger.  
 New York Despatch Refrigerating Line—Fred Meinhardt, J. F.  
 Baldwin.  
 Pettit & Reed, Inc.—M. C. Gregory.  
 Port Huron Salt Co.—D. L. Robbins, A. R. Gray, G. J. Langtry.  
 Thatcher Manufacturing Co.—J. F. McKeon.  
 Torison Balance Co.—Daniel Taylor.  
 Wells Richardson Co.—E. Sudendorf, F. J. Blood.  
 Worcester Salt Co.—A. F. W. St. John.  
 Wyandotte Cleaner & Cleanser—Harry M. Smith, Harold Craig Smith.  
 Wykes & Co.—Thos. E. Wykes, Jr., Claude P. Wykes.

The members and their ladies met in the lobby and parlors of the Cody Hotel and were escorted to the dining room to participate in the 5th annual banquet. The dining room was especially prepared for the occasion, seats for three hundred people being provided. The capacity was taxed to its fullest extent as quite a number of people were turned away.

Mr. Shilling's jolly way of introducing the speakers was thoroughly enjoyed by everyone present. He certainly made a hit with the Michigan Dairymen and should he ever come this way again he will be elected to the position of permanent toastmaster for the association. Short speeches were made by a number of members and the banquet lasted until the wee small hours of the morning. At its conclusion the supply and butter men were given a rising vote of thanks.

---

### FRIDAY MORNING SESSION.

Meeting called to order at 10 o'clock by President Lillie and opened with music by Misses Wilson and Magill.

The Chairman: I have just been informed that Professor Shaw cannot be here until this afternoon, therefore we will have to transpose the program and Professor Smith, who was to talk this afternoon on Lighting and Ventilation of Stables, will address us at this time. I have not the pleasure of a personal acquaintance with Professor Smith but, as I said yesterday of the bacteriologist, he is a part of the Agricultural College and that is a good recommendation to any audience in Michigan. I take great pleasure in introducing to you Professor Smith.

### PROPER VENTILATION AND LIGHTING OF DAIRY BARNS.

PROF. L. J. SMITH, AGRICULTURAL COLLEGE, LANSING.

Mr. Chairman, Ladies and Gentlemen.

While dairymen have generally understood the hygienic value of good ventilation and lighting of barns, it has been but recently that they have attached any great commercial importance to the subject. It is granted that cows need plenty of light and air, but the results of not attaining these conditions have not been clearly appreciated. The subject has a practical side, and is well worth consideration even though the humane phase of the question is of little interest.

Ventilation is necessary: First, to take away dust, germs and the fumes arising from manure; Second, to remove the vapor given off from the lungs and skin of animals; Third, to dispose of the carbonic acid gas ( $\text{CO}_2$ ), ammonia, etc. thrown off; Fourth, and of the most importance, to supply oxygen from the air for respiration. The average cow throws

off 10 pounds of moisture daily from the lungs and skin. This permeates the atmosphere of the stable, creating an unhealthy condition. A sure indication of poor ventilation is the condensation of moisture on the stable walls. This condensation is of practical use in that it takes part of the moisture from the air, leaving it in a dryer and more healthy condition. The amount of air necessary to supply oxygen to the cattle is ample for taking away this vapor, leaving the air in a comparatively dry condition.

Air once respired has lost about five per cent of its oxygen, and after it has been used the second time the lungs operate with noticeable difficulty. Experiments have been made at the University of Wisconsin in which the cows gave between three and four per cent less milk when the ventilation of the barn was restricted. The average cow breathes about 225 pounds of air daily, almost twice the weight of food and water it takes into its system. The amount of air breathed by different animals in twenty-four hours is shown in the following table:

	Per hr.	Per 24 hrs.	
	Cu. ft.	Lbs.	Cu. ft.
Horse .....	141.7	272	3401
Cow .....	116.8	224	2804
Pig .....	46.	89	1103
Sheep .....	30.2	58	726
Man .....	17.7	34	425
Hen .....	1.2	2	29

The amount of air necessary for a cow depends on several conditions. If the barn is cold, the animal will breathe more than when it is warm. A cow being fattened will need more oxygen than when under ordinary conditions, as will a cow giving a large quantity of milk. While the average cow needs the oxygen from 2,800 cubic feet of air per day, a great deal more than this amount is needed in order that the air shall be kept pure enough for use. The air breathed from the lungs of the cow mixes with the pure air coming into the stable through the inlet flues and renders it impure. The degree of purity of air necessary for healthy respiration is not agreed upon by those who have made a study of the question. *It is unfortunate that some seem to be working with the idea of giving the animals just as little air as they can possibly get along on, instead of giving them plenty of air and as pure as possible.* Some hold that the air breather should be 90% pure (considering the air coming into the stable as pure), while others maintain that the air can be as low as 95 per cent and even 90 per cent in purity. Prof. King uses 96.7 per cent as the necessary degree of purity. It is almost impossible to designate a hard and fast rule to follow, but it is known that animals experience no apparent evil results from breathing air 96.7 per cent pure, that is, containing 3.3 per cent of air which has been previously breathed. If we assume 96.7 per cent as the standard degree of purity of air, 3,500 cubic feet of air per hour must be provided for each cow instead of the 2,800 cubic feet per day mentioned in the table.

Having touched upon the necessity of fresh air and the amount needed, we will consider briefly the general method of, and the reasons for, the type of ventilation known as King's system, which is used

broadly in this country and which operates with good results in any well built stable. Naturally the air at the top of the stable is warmer than at the floor. For this reason a stable should have a comparatively low ceiling to bring the warmer air nearer the cows; eight and one-half feet should be plenty. In this connection it would be well to say that the smaller the size of the stable for a given number of cows, the better. It gives a minimum volume of air to be heated and a minimum wall surface, which would lessen the amount of radiation or heat loss, as well as save in the amount of building material.

The air breathed out by the cows is heavier than fresh air and warmer; but it cools quickly and if there are no drafts, would be found in larger proportions nearer the floor than the ceiling. Since the air at the ceiling is warmer, it would cool the barn if the outlet ventilation flues took the air from the stable near the ceiling. The cool air, which is also the most foul, being near the floor, it is best to take the cool foul air out of the stable by having the opening of the outlet flues near the floor. The air being warmest at the ceiling, Prof. King has arranged to introduce the fresh air at the ceiling where it becomes warmed before the cattle have a chance to breath it, and prevents cold drafts along the floor level. The outlet flues run to the peak of the barn into the cupalos, or rise above the ridge, often mounted by a cowl to keep out the rain and snow. This cowl should be high enough above the top of the galvanized iron flue so that the wind can flow readily across the top of the flue. This helps create a suction up through the ventilating shaft. If these flues go up through the roof at any other place than the peak of the barn, they should extend upwards so that the top is a little above the level of the ridge. The outside opening for the inlet flues is located about one foot above the ground level. The flues are made so that the air comes in at this point and rises between the studdings and the siding and inside sheathing, entering the barn near the ceiling.

The inlet flues being short, there is little friction to retard the incoming air currents. If the weather is still, the flow through the flues will be quite uniform. In windy weather, the air will come in on the windward flues at an increased velocity, while there will be little if any air movement in the leeward inlet flues. Sometimes in very windy periods the air will go out the leeward inlet flues. The velocity of the air up the outlet flues in windy weather is small on the windward side and correspondingly greater on the leeward side of the barn.

The flow of air through these ventilation flues varies greatly. The velocity of the foul air up the outlet flues increases with a greater difference in temperature between the inside and outside air, and with a longer and larger flue. The flow is better in absence of drafts in the stable resulting from a poorly built cold barn, and badly fitted doors and windows. With a difference in temperature of  $20^{\circ}$  F. the theoretical velocity through a smooth 40 foot ventilating shaft one square foot in area is 36,000 feet per hour, or 600 feet per minute. Counting for friction losses etc., in actual practice a velocity of one-half of 600 or 300 feet can be obtained per minute. Taking this as a basis to work on, the flow per hour through this 40 foot flue would be  $60 \times 300$ , or 18,000 cubic feet. As each cow needs 3,500 cubic feet per hour, the flue would take the above amount of bad air from a barn and 18,000 cubic feet of fresh air would replace it, which would be enough for five cows. A dairy barn for

forty cows would need eight square feet cross sectional area of outlet ventilating flues, which would make four good sized flues, having an area of two square feet each. The flues could be made one foot by two feet in size so as not to extend too far out from the side of the barn. Two would be put on each of the long sides of the barn. Where it is possible, it is better practice to run the outlet flues straight up through the loft of the barn instead of along the cold sides and roof.

The intake flues should have the same combined area as the outlet flues, but the practice is to make them smaller and have more of them. Eight or ten flues would be a good number in this case. If ten were used, four would be placed on each of the sides of the barn and one on each end. Each flue would have to have eight tenths of a square foot cross sectional area, or 115 square inches. If the studding were two by six's and placed 24 inches on centers, the space between any two studdings and inside and outside sheathing would have an area of six by twenty-two or 132 square inches, which would be ample to be used for these inlet flues. The inside and outside openings could be made to have an area of 115 square inches. The leakage of air around the doors and windows help out the inlet flues to a large extent.

It must be remembered that if the outlet flues is less than 40 feet high, and the difference in temperature is less than 20° F. that the practical velocity of the air will be less than 300 feet per minute. On the other hand, if the height remained the same and the difference in temperature increased, the velocity would be more.

The following is part of a table given by Prof. King, of the computed theoretical flow of air through straight ventilating flues one square foot in cross section. The actual flows are about one half of the given figures.

Difference in temperature.	Height of ventilating flue.			
	20 ft.	30 ft.	40 ft.	50 ft.
	Flow of air in cubic ft. per hour.			
20° F.....	26,100	31,800	36,700	41,200
30° F.....	31,900	39,100	45,100	50,500
40° F.....	36,900	45,100	52,100	58,200
50° F.....	41,200	50,500	58,200	65,200

These figures are in round numbers. The suction of the wind blowing across the tops of the flues increases the velocity in windy weather.

Prof. King gives the following general rule for the number of square inches area of intake and outtake flues for cows and horses. He says: "Intakes and outtakes for horses and cows should provide not less than 30 square inches per head, when the out-take flues has a height of thirty feet; if the out-take is shorter, the area should be greater, if it is higher, the area may be less. A 20 foot out-take would require about 36 square inches per head instead of 30 inches."

As has been previously stated, the temperature of the stable has an important bearing on ventilation. The greater the difference in the temperature between the inside and outside air, the better is the ventilation, and as a result more cold air enters the stable and must be heated. Good ventilation is not necessarily secured at the expense of the temperature of the barn. Probably from 45° to 55° would satisfy the average requirements for a good temperature for the dairy cow. It has been found that a cow throws off enough heat from its body to raise the temperature of the 3,500 cubic feet per hour of fresh air necessary for the cow between 45° and 50°. In other words, if there were no heat lost from radiation through the walls and ceiling of the stable, and if air at the given rate were entering the stable at 8° it would leave the stable through the outlet flues at a temperature between 53° and 58° F. Some of this heat is lost as before indicated, but in a test made in the college dairy barn, each cow was getting 3,500 cubic feet of fresh air per hour when the temperature outside was 8°, and in the barn it was 46°.

There are methods of ventilation other than that which I have thus far briefly described, but none seem to be as thoroughly worked out with the idea of keeping up the temperature of the barn, avoiding drafts, and furnishing plenty of warm air under all conditions, as the King system. The Dairy Division of the Department of Agriculture at Washington will soon have a bulletin out on this subject in which they will doubtless be able to advise improvements on the methods in use. There are bulletins and books now published on this subject, the addresses of which I can furnish if so desired.

It is well known that light exercises a strong retarding influence on the life and growth of bacteria. Plants cannot thrive without light, nor can animals thrive as they should without the sun's rays. Just how much window area is necessary for a given floor area in a barn, is not known. The college barns have at least one square foot of window for every 25 square feet floor space in the stables, which means a floor space five feet each way. Windows should be placed as high as possible without the eaves (if it is a one story barn) cutting off the sun light. This will put the sun light farther into the barn and will place the glass out of reach of the cattle, thus lessening breakage. Window frames more nearly square are better than long, narrow ones. Where the ceiling is low it would be better to have the windows longer horizontally than vertically and continue as near as possible entirely around the part of the barn occupied by cows. Dull walls absorb a large amount of light. If the interior of the barns were whitewashed, the increased intensity of the light in a barn would be very marked, for white coatings reflect the light. If the dairymen would keep their windows more clean, it would make a great difference in the amount of light let into the stables. If the windows are so dirty that one-tenth of the light is cut off, it would be far better to have one-tenth less windows and keep them clean.

Some stables need more light than others. A narrow stable is easiest to light because the sunlight from the windows strikes nearer the center of the barn. Unless the barn has a low, nearly flat roof, skylights are out of the question as such barns would have too great a volume of air to heat.

It is unfortunate for the dairy industry that many dairymen overlook the need of plenty of light for their stables. This is especially true

of basement barns. Here the tendency is to restrict both light and ventilation. Many such stables have less than one square foot of glass to 100 square feet floor space.

Basements are generally very warm and could be easily ventilated. The inlet flues on the open side or sides of the stable are either boxed in or put in the walls with soil pipe when they are built. On the sides where the earth banks against the foundation wall two methods are commonly used. When the bank does not rise to the ceiling, a six inch or eight inch sewer pipe is put through the wall near the ceiling, and an elbow is put on the inside and with the other end turned up. If the ground level is above this horizontal pipe, and elbow can be connected to the outer end and sewer pipe run up one foot above ground and covered with a one-half inch wire screen.

Ventilation flues should be cleaned occasionally. Dust, straw, and hay clog the one-half inch mesh wire covering the entrance of the flues, and eventually fill the bottom the flue, cutting off the ventilation entirely. The inlet entrances should be placed at least one foot above the ground level and then should be watched in winter to prevent snow from banking against them.

Registers such as are used in hot air heating systems are often used at the inlet entrances and for covering the upper outlet openings. Personally, I do not like the registers. They clog easily and it is hard to tell if they are open or closed. At the inlet entrance a horizontal wooden slide can be easily and cheaply made to cover and adjust the amounts of opening. The outlet flues commonly have a large opening at the ceiling which is left closed in the winter and opened in the summer to draw off the more heated air when the barn is too warm. These openings can be cheaply covered by a swing door with the hinges on the upper side. A cord and pulley can be easily arranged to open this door any amount. The outlet flues are generally made of light sheet iron and should not be in contact with the outside wall after they pass through the ceiling of the stable. They can be made more nonconducting by lining them on the outside with wood. The inlet flues should be provided with a piece of sheet iron curved to turn the air upwards as it comes in at the bottom, and a piece to turn the air into the stable when it reaches the top of the inlet flue.

#### DISCUSSION.

The Chairman: No one was appointed to lead in the discussion of this paper so it is open for general discussion. I want to caution you, however, that you have to be brief in this discussion for want of time. If you have questions to ask I wish you would have them to the point and do not delay in asking them.

Professor, what do you think of this idea of cheese cloth ventilation, putting a cheese cloth covering on the windows and taking out the glass?

Prof. Smith: I think it will be all right in absence of a better system. I believe the King system is much better than that. If you have that kind of cloth across the openings of the window it would be well to have the window so it will operate on hinges so it can open inwards and the air coming in could strike against the window and deflect upwards against the window.

Mr. Foss: What material would you advise using for outlet, wood or iron?

Prof. Smith: Galvanized iron or sometimes a light sheet iron is used.

The Chairman: Would you not think there would be some danger from lightning by having the ventilating shaft lined with iron of any kind?

Prof. Smith: I do not think so. If the lightning would strike those flues it would conduct the lightning to the ground.

The Chairman: I do not know about that. Your flue is only within a foot of the floor. It seems to me a dangerous place for your flue to leave off.

Prof. Smith: I have conducted a few investigations along this line and have not known of a case where that has occurred.

Member: I do not understand how he is to keep the barn warm enough. I was at the improved Stock Breeders meeting and visited the barn at the college and it did not seem to me that the cows were warm enough. Another thing about sunshine, do you think it a good thing to have the sun shine directly on the cows?

Prof. Smith: As to the last question, I cannot see that it would harm the cows. The average barn is so built that the head of the cow is inward, that is facing the inside, and I would not think the sunshine on the cows would be objectionable at all. They have to stand it out of doors. We have on one side of the dairy barn some light cloth screens they put up to keep the light from coming in too freely in some of the small box stalls there.

I do not believe the dairy barn is too cold. It may be possible they had the doors open at that time or just previous to that, or had too many inlet flues open. In cold windy weather it is best to close up some of the inlet flues, but in such weather as this we can leave all of the inlet flues open and the barn will keep warm. Of course we have to get used to the proper amount of air coming in or out. If the system is properly made there will be very little trouble heating the barn. You can close the inlet flues until you get the proper temperature and there should still be enough air passing through the barn.

Member: What do you consider the proper temperature of the barn?

Prof. Smith: That would depend on the conditions. It seems to me that if a cow is just being maintained it should be kept at a higher temperature. It does not cost so much to feed it. In a colder barn she will eat more. A cow being fattened should be kept in a colder barn than a cow that is not eating so much, because she will have more appetite. I think a dairy cow should have a temperature in the barn of at least 45 degrees. There is a great deal of difference of opinion on that and I do not pretend to be an authority on the subject.

Mr. Phillips: Would not letting the windows down from the top be a good thing? The hot air and the odors rise to the ceiling. If the fresh air comes in from the top it has a tendency to purify it.

Prof. Smith: That is true to a certain extent. The air breathed from a cow is of a higher temperature than the air surrounding the cow and that air will no doubt rise up but it cools very quickly and, since the air that comes from a cow is greater in density than the air surrounding the cow, that will work gradually to the floor, so a



larger percentage will be nearer the floor than the ceiling; if the fresh air coming to the ceiling is warmed before it comes to the cow, so the cow will get fresh air and still quite warm.

The Chairman: If you allow the warm air to get out near your ceiling in cold weather, it is almost impossible to keep the temperature of your stable.

Mr. Warner: Where your barn has plenty of windows, would you advise that the hot sunlight be allowed to come in there all summer through the hot hours of the day? I might say that is not my idea. On the windows of my own barn I have burlap curtains that are put over the windows before the cows come in in hot weather. I allow the sunlight in there and the windows are open after the cows are turned out in the morning and while the barn is being cleaned, but before the heat of the day those curtains are put down until next morning.

Prof. Smith: It is my opinion that that is a proper method of procedure. As I said before, at the dairy barn they have those light cloth curtains that they can throw down in the hot part of the day and keep the temperature of the barn as cool as possible, so when the stock come in later in the day the barn will be cool. These openings at the upper end are at the ceiling in our ventilating flues and will take out a good deal of that warm air. In the paper I had this morning I did not describe specifically any specific system because it was impossible to describe it without some sort of sketches to follow. I can give you the names of those two bulletins which will be of value in putting in a system and in adjusting or changing the system which you have, if you care to do that. These bulletins came yesterday to me from the University of Wisconsin. The name of the bulletin is "The King system of Ventilation." It gives a good many illustrations of the various methods of putting in outlet and inlet flues for different kinds and shapes of barns, both for the basement barn and for the stable that is above the ground level. Professor King has also written a book on ventilation, which is just out. That book costs 75 cts. and is written by Professor King of the University of Wisconsin. You can get that book by writing to the University and sending 75 cents. If a farmer is contemplating putting in a ventilating system it will pay him to buy this book.

The Chairman: It will pay better to visit some barn that is ventilated and get an object lesson. You will make no mistakes then. You could afford to spend the money to go clear across the state to see a barn that is properly ventilated.

Mr. Oliver: I would like to ask the chairman if with any system it is not largely a matter of judgment on the part of the man who controls the stable? Are the temperatures and conditions even with the King system?

The Chairman: The King system is as nearly automatic as anything I know of. You can go to bed with the assurance that your cows will have fresh air all night long. When you are away to this dairy meeting you know you dare not leave your windows open for fear it will get too cold and with the King system you know your cows are getting pure air all the time you are here. If you follow directions given here you will have the right amount all the time.

Yesterday afternoon we had a couple of papers left over, and we will take up those papers now. Mr. B. D. White, of the Department of Agriculture, was to talk to us on Creamery Management, but Mr. White could not be here and Mr. Credicott, who scored the butter, is to take his place on the program. I do not understand that he is going to talk to us on creamery management but he is going to talk to us and from what I know of Mr. Credicott I know he is going to say something that will do the dairymen a lot of good. I will now call on Mr. Credicott.

### ADDRESS.

MR. H. J. CREDICOTT, FEDERAL INSPECTOR, CHICAGO, ILL.

Mr. Chairman, Ladies and Gentlemen:

I never like to take up a subject as a substitute because the man that is chosen to discuss the subject is usually the man that is best qualified, and in taking Mr. White's place I am not going to attempt to talk much on creamery management except to leave one thought with you on that line, and that is in order to have our creameries successful and have them compete with the larger creameries, the centralizers, they must adopt better business methods. It is the history of business that people are wasteful in manufacture until competition forces them to use better methods. The large packers of Chicago are making their profit on the material that the small butcher in the country throws away, and it is getting to the point where the centralizer makes his profit over the small creamery on the losses that the latter are making, and it is up to the small creamery to adopt a better system of management and to check up these losses if they wish to compete with the centralizer. I am not afraid of the small creameries surviving if they improve their methods, because the small creameries can make better butter than the centralizers as the latter is bound to get his raw material in poor condition, and moreover he does not come in personal contact with the patrons and cannot influence them towards better care of their cream as the local creamery man can, so that the centralizer is bound to make a poorer grade of butter. The small creamery will on the whole have the advantage in the market if it will look after the quality of its raw material and have a better system of checking up.

The main trouble with the average small creamery management is there is no check on the business; they do not know what they are doing until the end of the month. The centralizers knows every day, at the close of the day's business, just how many pounds of butterfat he has paid for and the following day he knows how many pounds of butter he has made from that, what his overrun is and what his profit is on the day's business. The smaller creameries must adopt methods similar to those if they wish to survive.

Mr. White's work in Washington has been largely on the management of creameries. He started in two years ago and, in order to get a line

on what the creameries were doing, he asked them to send reports of their monthly statements and yearly statements showing the business. These reports were examined very carefully and mistakes and short comings pointed out to the creameries. By averaging these reports they have been able to find out what might be expected of creameries and with proper influences the prices paid to their patrons. I have not those figures with me. Mr. White expected to be here himself and did not provide those figures but I will give you an outline of some of those things as I remember them.

They found that the particular factor that affected the price paid to the patrons was the over-run, that the difference in price on the butter did not enter into the matter as largely as did the overrun, although it was an important factor; they found, taking 18½ per cent as the standard for overrun that a creamery ought to get underaverage good conditions, that the creameries under that standard paid a good deal less for butterfat than the creameries that were getting that standard. Mr. White had these arranged in three classes, and it showed very conclusively that the overrun makes a great difference. I will not try to take up more time on that but just leave that thought with you—that you must study your business, must get a check on it so you will know the amount of butterfat you are buying every day, know where the losses occur if any, and then you will be in a position to stop them. If you continue to do business as you have done it in the past and do not know how you are coming out until you balance up your month's business you are not going to compete with the larger creameries, because at the end of the month how are you going to find out where your losses are? But if you check up every day you can stop those losses.

Now to go back to the question of quality in butter. You probably all know I am working most of the time grading butter in the markets, scoring butter in educational contests and conventions of this kind, and I have had an opportunity to know about the average quality of butter in this country as few men have, because I have been scoring the butter in so many different states and have found that the quality of our butter is constantly deteriorating, and this holds true of all the large butter producing states. It is not a condition that you will find alone in Michigan; you will find it in Minnesota, you will find it in Wisconsin, you will find it in Iowa.

I have been asked many times since I came to this convention "What is the cause of the poor quality of the butter?" and I almost invariably answered "Rotten cream." Now I have been censured several times for making the statement publicly that the quality of our butter is deteriorating and that we are accepting cream which might be termed rotten, but I believe it is time the dairymen woke up to the fact that they are making a lower grade of butter because of the careless handling of cream and that something must be done by the creamery men and dairymen to bring a better quality of cream to our creameries.

The butter on exhibition at this convention shows conclusively that you have a great deal of poor cream. It is the main fault with that butter, although there are undoubtedly many faults due to the butter-maker. Probably some of the old flavors we have credited to old cream

are due to some extent to the buttermaker holding the cream too long in the creamery, but in the majority of instances the cream was of such poor quality that I do not believe any buttermaker with any kind of equipment could make a fancy piece of goods out of it. The hand separator has been blamed for this condition and it is to some extent responsible, but it is not the hand separator but the abuse of the hand separator that is causing this. As good butter can be made from hand separator cream as from whole milk, in fact from a theoretical standpoint the butter can be better because the cream is separated while the milk is fresh and you have a smaller bulk to cool and care for and it should be easier to take care of, but in fact we find almost invariably the creameries that receive hand separator cream are making a poor grade of butter. That is simply because the dairyman has his product in a concentrated form and can hold it longer on the farm without it spoiling. The whole milk creameries separate their milk at the factories and must have that milk at least in a sweet condition. In many factories it is kept long enough to develop stale flavors but still it is in much better shape than the average hand separator cream because it has to be delivered to the creamery before it sours, whereas the hand separator cream is kept on the farm until it has developed unclean flavors and one can of that cream put into a whole churning of fine cream will spoil the churning. It is bound to show up, we cannot help those stale flavors and this trouble is simply due to careless handling and holding the cream too long on the farm. If this product was not concentrated so it could be held so long it would be easier to control it, under the present conditions if the small creamery manager speaks of the quality of cream the dairymen are producing and tries to get them to do better, they will say they can ship to the centralizer or the neighboring creamery. This is true. The centralizer stands ready to take almost any grade of cream and this has gradually lowered the standard of our cream. This is getting to be a serious situation, much more so than the creamery men realize.

I have been trying all winter to say something to the creamery men and the dairymen at the different conventions that would arouse them on this subject and get them to take some united action towards getting a better grade of cream, but they are indifferent on the subject. The creamery men refuse to realize that butter is getting poorer. They simply say at conventions the judges are becoming more critical and are not scoring according to market standards, but if you refer that matter to any butter dealer in the large cities, who will give you an honest opinion as to the quality of the butter, he will tell you it is deteriorating right along and that we are making butter poorer on the average than we were a few years ago. In order to prove this statement, I wrote to most of the large butter dealers in the United States this Fall and asked them their opinion as to the percentage of different grades of butter and how this would compare with five years ago. They replied, with very few exceptions where the parties did not report, that there was a very great deterioration in quality and that we were making a small percentage of fancy butter at the present time. With such evidence as this, it seems to me it is time for the dairymen and creamery men to get together and take some action towards crushing out this traffic in rotten cream, or stale old cream because it is ruining the qual-

ity of our butter, making it so poor it does not require a butter judge to tell you it is poor. The average consumer when he puts it on the table can easily tell it is poor, and even if he does not know enough about the quality of butter to say it is not of good quality, still the flavor does not appeal to him and he will eat less than he would if he had good butter on the table, with the result that the consumption of butter is cut down very materially, and this, coupled with high prices, is making a serious situation. If this keeps on I believe we will have lower prices, because we will decrease in consumption and increase in the amount of poor butter on the market. There never has been and never will be enough fancy butter to supply the markets of this country. Even in the dulllest times in the winter when trade is dull, there is a demand for fancy butter. It is only the poor quality of butter that accumulates in the market and I believe as time goes on there is going to be more trouble in getting a market for poor butter. The small creameries that do not do something to improve the quality of their butter and furnish a better grade of butter will lose out in the long run, they will gradually get less money for their butter until they are in a position where they cannot compete with their neighbors who have improved the quality of their goods.

It is not imposible to get good hand separator cream. I have had a chance to inspect butter in the Chicago market and other markets from hand separator creameries, where they do not receive a pound of whole milk, and yet their butter will grade extras the year round. What is the reason for that? It is simply that the buttermaker or the manager or somebody connected with that creamery has had enough foresight to work with those patrons and showed them the danger of ruining the quality of their product and induced them to take better care of their cream. It does not require extreme care to make good cream, ordinary sanitary methods and delivering the cream before it becomes stale are all that is necessary. But if we keep on with this low grade quality of cream it is hard to tell where it will end and I believe it will result in the death of many of the small creameries. It is working that way in the Western states, in Iowa and Minnesota. Minnesota is said to be one of our great dairy states and turns out more fancy butter than any state in the Union. The New York commission men have long gone to Minnesota for large quantities of fancy butter but they are getting less out of Minnesota every year and more of this poor butter, and last year there was a decrease of nearly one hundred of the total number of creameries operating in Minnesota. Those were small creameries that allowed the hand separator to come in without making an effort to show the people that they must take care of their cream, so they have made poor butter and finally had to close their doors. That is taking place right along in all the states and it will be true in Michigan as well as Minnesota. In Michigan you have not up to this time had as much trouble with the large centralizers as they have had in Minnesota but you are bound to have them and you will lose out unless you do something to strengthen the position of the small creameries. I believe the thing that will strengthen their position more is to go after a good quality of raw material and make good butter and then you are always sure to have an outlet for your product at a good price. I thank you.

The Chairman: We will take just about five minutes to discuss this subject, if anybody would like to ask Mr. Credicott a question.

#### DISCUSSION.

Mr. Helmes: I would like to ask the speaker what methods he would advise the creameries to adopt to get the farmers to deliver a better grade of cream than they do at present?

Mr. Credicott: That is largely a matter of the personality of the buttermaker or manager of the creamery. He must be a man who can impress his views upon the patrons of the creamery, showing them that it is to their interest to produce a better quality of raw material. I believe many of the buttermakers have that ability if they will only try it, but this hand separator cream business seems to take the nerve all out of the buttermakers. They are afraid to do anything. As soon as they get the hand separator cream they throw up their hands and they take that rotten cream without a protest, afraid it will go to someone else. I believe in many cases this talk of shipping to centralizers is all "bluff" and if the buttermaker will take a decided stand he can get good raw material. I know creameries that have had buttermakers that have taken that stand and I know of creameries in Minnesota, in the state where I was born. There is a centralizer in one of the small towns, probably one of the worst centralizers in the state. In one territory they paid one price, in another another price, encouraging the farmer to keep his cream ten days to two weeks because they knew that would ruin the standard of cream taken to the creamery, and put the local creameries in a position where they cannot compete with the centralizer. They have killed a number of creameries around that town. A few years ago there were a dozen of local creameries within a radius of fifteen miles of that town. Today they have not over half that number. This particular creamery was only twelve miles from that town. It had been a prosperous co-operative creamery but the centralizers got after it and they had been obliged to take the poor stuff and lost their patrons with the result that the creamery ran in debt and did not know whether to close their doors or make an assignment, but they hired another buttermaker and that man in two years put that creamery on its feet, and today they are getting a good quality of cream and making good butter for which they are receiving a fancy price. I am told their butter rarely scores below 94. You could not get a patron away from that creamery if you paid fifty cents a pound for butter fat because the farmers there know what it means to ship their cream to a centralizer and lower their standard, and they are willing to stand by the local creamery even though the centralizer offers them more than the local creamery can pay, because they know if that creamery was out of business they would receive a lower price, also realize that by making a better quality of butter they are getting more money and have their business on a safe foundation.

As to the method for caring for cream. I visited a creamery in Illinois last summer that was receiving hand separator cream. They had some whole milk but used it for city business and ice cream purposes. That cream came in during the day, the last of it about four in the afternoon. It was simply put in a vat and ripened up, as we made butter seven or eight years ago, cooled down in the evening and churned the next

morning, and that buttermaker turned butter out that scored 93 to 94 every day. I examined his butter, noted how he handled his cream and I asked how he was doing it. He said "I made up my mind the only thing to do was to educate the patrons to start right in the hand separator business and I teach them how to care for their cream. I fix an oil barrel so that the water can run through it and tell the patrons they must keep their cream cool. That is all the directions I ever give. I do not make strict requirements but simply get them to agree to use that barrel after I have fixed it and told them how." He was getting cream every other day in July that was making 93 to 94 butter without a starter or pasteurizer. I do not believe in making butter in that way but it shows that the buttermaker was getting a fancy grade of cream from which he could make butter in that old fashioned way. What that man can do in Illinois, where he has a big competition in city business and also big centralizers coming in there to get his business, it is possible for every buttermaker to do. What we must give the farmer is not complicated rules for taking care of his cream, but something cheap, practical and easy. Show him that what you are asking is reasonable. We talk a lot about educating the farmer. I tell you the average farmer knows he is not doing right with his cream but as long as he finds a market for it without complaint, he is going to make that kind of cream.

Mr. Probert: Is the per cent of overrun staples, or does it vary to any great extent?

Mr. Credicott: It will vary in the best managed creameries to some extent. The variation, as a rule, in the creamery is cut down a great deal as soon as they commence to keep close records of their business, because they find the leaks and they have a more uniform overrun, but in the creameries where they do not keep close records the overrun varies considerably because they may have conditions some days that lower the overrun very materially. One day they may get a very low moisture content, may have a loss in churning or their test may have been too high and unless they have the means of checking out on that very day it will make a large variation, while in the creamery where the overrun is checked up it does not vary a great deal.

The Chairman: Now, Gentlemen, we will have to stop this discussion. We have only had one paper on this morning's program. I hate to cut you off but I do not see any other way. We have another paper yet to get out even this morning. We got Mr. Moore over from Wisconsin and must give him a chance to read his paper. I am going to ask him now to read his paper on Cream Rates. Mr. Moore is the secretary of the Wisconsin Buttermakers Association and has given this question of cream rates a very careful study.

## CREAM RATES.

MR. J. G. MOORE, SEC'Y WIS. B. M. ASS'N, MADISON WIS.

Mr. President, Ladies and Gentlemen:

I told Mr. Lillie this morning that if time did not permit I would do as they did in Congress, ask leave to print. Over in Minnesota, at the Minnesota State Dairymen's Convention, I read a paper on "Do the Minnesota Dairymen need a protective Association" and I wish time permitted and I would read that paper because here is an incident of why you should need that protection. Let me read an item from this week's Chicago Produce.

At your last session in Battle Creek I had the pleasure of reading a paper to you on Evolution of the Dairy Business. At that time we had very little time and I read my paper to you so fast that I doubt if very many of you got the gist of what I had to say. My wife cautioned me that I read and talked so fast that no one could keep up with me.

Starting with the earliest history of the business I endeavored to place before you the changes that had taken place and at the close I said a few words about the *cream rate case*, then pending.

The first time, so far as I am aware, that the question of rates affecting the dairy industry was raised, was when the Hon. J. Q. Emery, Dairy and Food Commissioner of Wisconsin, at the Wisconsin Butter-Makers' Convention held at Wausau, Feb. 5-8, 1907, spoke as follows:

"In my judgment never in the history of this state has the local creamery industry been so menaced as at the present time.

If our local creamery interest in Wisconsin, this magnificent dairy state with a total annual income from her dairy products of more than \$57,000,000, is to continue and advance that industry, there are certain conditions that are absolutely indispensable. First and foremost, cleanliness in dairy products from cow to consumer; second in our creamery work the testing of butterfat in cream or milk must be done with intelligence, with painstaking care, and with absolute honesty; third, there must be no discrimination in railroad transportation by the roads between the various classes of these dairy products.

Now, gentlemen, this is a serious proposition and there is no body of men so called upon to deal with the proposition as the Wisconsin Dairymen's Association and the Wisconsin Buttermakers' Association.

I state to you things that I know, when I say a local creamery is charged one dollar a hundred to ship its butter to Chicago by express. Now keep that in mind; at the same time, from the same place, they take one hundred pounds of cream to Chicago for 26 cents. The cream is 40 per cent butterfat. Now under the arrangements a large proportion of the cream that is shipped to Chicago centralizers average 40 per cent butterfat. It amounts to this, that the Chicago centralizers get this butter for 52 cents a hundred for transportation charges; while the Wisconsin local creamery pays one dollar a hundred to get its butter to Chicago.



Gentlemen, that is not a square deal. In addition to this the railroads return the cream cans free of charge. They do this by shipping as baggage.

Thus it will be seen that by the action of the railroads the Wisconsin local creamery is placed in a position of particular hardship if this thing continues. No Chicago centralizer, nor any other centralizer, can get out of a farmers cream any more, honestly, than a local cooperative creamery can get out. Therefore it is to the interest of every Wisconsin farmer to stand by the Wisconsin local creamery. He gets all there is in the overrun and everything.

The dairy sentiment of our state, the railroad commission and all the forces of our state should stand as a solid wall in defense of our dairy interests as a part of Wisconsin. Not only should they stand as a stone wall, but should be just as aggressive as a mighty army seeking to gain what is right and just in these matters. .

The Creamery Buttermakers' Association can do much to bring the matter to a right turn."

The rate under which cream was moving is know as the 33 cent rate for a 300 mile haul. This rate, according to testimony introduced at the hearing in Chicago before Judge Prouty of the Interstate Commerce Commission was first put into force about the year 1889, at a time when by reason of drough and other causes, farmers were emigrating from Nebraska; there was no money in the country and at the insistence of Pres. Haskell of the Beatrice Creamery Company the railroads put in this low unremunerative rate to see if it would help a condition of affairs which it was agreed could hardly be worse.

Under the influence of this low rate, concentration of cream supplanted the old skimming station plan of operation and the centralizers so-called waxed fat. It is conceded at the outset that in states like Nebraska, Kansas, Wyoming, Colorado, Oklahoma and Missouri, that the cow population is not dense enough to support any other system.

The success of the centralizing system in the states mentioned, led the largest of these concerns to look around, like Alexander, for more worlds to conquer and fastening their eyes on the rich dairy states of Minnesota, Iowa, Wisconsin, Michigan and Illinois, decided to move to Chicago and claim that before doing so that the railroads had granted them a low rate, starting at 135 miles and known as the 38 cent rate.

There is an old saying that "the devil should be given his due" probably on the assumption that he is not always as black as he is painted. On the same theory we must give the railroads credit for a desire to have the communities and industries along their lines prosper. It is conceded, I think, by most people that if the farmer is prosperous all other lines of business will be apt to be prosperous also. The railroads from their close touch with conditions discovered that even under the low rate in force for the transportation of cream that dairying was not growing so rapidly in the states above mentioned as it was in Wisconsin or Minnesota where the local creamery and cheese factory system prevailed. I do not claim that this action in endeavoring to raise rates was taken alone for the altruistic purpose of fostering the dairy interests, but I do claim that the increased prosperity incident to specialized dairying would bring increased revenues to the railroads.

This effort on the part of the railroads to raise rates was met with determined opposition by the centralizers in Chicago and they went before Judge Kohlsaat of the United States Court and secured an injunction pending the hearing of the case by the Interstate Commerce Commission.

Feeling that the interests of the local creamery and cheese factory were involved in this case certain men interested called a meeting July 30, 1907, and after discussing the matters thoroughly decided to organize and secure an attorney to represent us at that hearing.

Judge Barnes, now of the Supreme Court of Wisconsin, former Chairman of the Wisconsin Railroad Commission, was secured to represent the dairy interests and at the June hearing his knowledge of the case at hand was invaluable to us.

At this hearing, devoted for a week to hearing the centralizers side of the case, it was brought out that the cost to the centralizer in making up a pound of butter, was nearly five cents a pound, whereas testimony introduced later showed that the best local creameries in Wisconsin make butter for less than 2 cents per pound. This difference in cost of manufacture does not explain entirely the difference in prices paid by the two systems. Permit me to quote from the report of the Chief of the Bureau of Animal Industry for 1907:

"The investigations, made by the members of the dairy division, show that the cooperative creamery yields the largest returns to the farmer for his butterfat. The individual and combination creameries usually being located in close competition with the cooperative creameries, pay very nearly as much. The centralizers, where they have gained a monopoly, pay as little as the farmer will accept. Reports from June, 1907, show that in Kansas and Nebraska, where the monopoly appears to be complete, the farmers received only 17 to 18 cents a pound for their butterfat, while in Northern Iowa, Minnesota, Wisconsin and Illinois where the cooperative creameries have the field, the prices were from 25 to 26 cents per pound."

Let me quote further from the same report:

"There can be no doubt that the tendency of the centralizing system is bad for the farmer, and the public. The effect is to exact high prices from the consumer and to pay low prices to the farmer, the profits going to the large operators who control the situation. The small local creameries should be encouraged."

At the June hearing the attorney for the centralizers, waxing indignant, shaking his fist at the attorneys for the local creameries, said: "We challenge you to produce a single creameryman who has been put out of business by the centralizers." At the September hearing we had men from Missouri, South Dakota, Iowa, Minnesota, Wisconsin and Michigan ready to respond to this challenge, but owing to Commissioner Prouty reversing himself, we were unable to present their evidence as to the methods of the centralizers in their efforts to control the dairy business.

It has been claimed along this line that the centralizers paid different prices on the same day at different localities depending on whether there was local competition or not.

One witness, Jesse Anderson of Dolan, South Dakota, told how he

was paying 23 cents for butterfat the same as the centralizers was on both sides of him; Elgin market 26 cents. Notwithstanding a drop of a cent or two in the Elgin market price, the centralizers started in to buying cream from Mr. Anderson's patrons at 27 cents while paying at other places 22 cents.

But we do not have to take the testimony of any witnesses who might be said to be prejudiced against the centralizers.

Out of their own mouth shall they be condemned.

Mr. B. D. White of the Dairy Division had prepared a large number of tables showing prices paid at different places on the same dates and the accuracy of which figures were questioned by the centralizers. They were requested by Judge Prouty to file their own figures and from them we glean the following:

February 25, 1908, Fairmount Creamery Co., paid prices as follows:

Gallatin, Mo., 34 cents, distance shipped 230 miles.

Stewartville, Mo., 30 cents, distance shipped 180 miles.

Hamilton, Mo., 40 cents, distance shipped 220 miles.

Albany, Mo., 29 cents, distance shipped 210 miles.

Showing a difference of eleven cents. This is from the sworn testimony of the centralizers themselves. No evidence has as yet been produced to show that the local creameries pay different prices on the same day to their patrons.

The Continental Creamery Co., on March 14, 1908, at Edmund, Oklahoma, 23 cents, distance shipped 14 miles.

At Stillwater where a local creamery is operated they paid 27 cents, distance shipped 82 miles.

May 1st, 1908, at Mulhall, Oklahoma, they paid 18 cents, distance shipped 54 miles.

At Stillwater, 25 cents, distance shipped 82 miles.

At Billings, Missouri, the centralizers paid 8 cents per pound more than they did 200 miles nearer St. Louis where there was no competition.

Let me quote Commissioner Prouty: "Now what I want to do, I don't know how much bearing it would have on the case, but what I would like to do is to get at it, what is the best method for the farmer to handle his business? What secures him the best market for his cream? and in order to do that we must know how the centralizers operate and how the local creameries operate, and if it turns out that the Beatrice Creamery Company, which manufactures, as I remember it, about one-fifth of all the product made by our creameries in the United States; if it should turn out that you are unable to combine in the same way the elevators have combined, for it is the same proposition over again, to obtain from the farmer his cream at less than a fair price, I think that would be a reason why the Commission might, in adjusting these rates, lend its weight to the institution of a different way of doing business."

As the producer is the main person to be considered as being affected by the success or failure of the two systems of manufacture, figures secured by the Dairy Division at Washington, show that Wisconsin creameries paid in 1907, an average of 28.76 cents per pound at a cost of 2.10 cents for making; Minnesota paid 27.99 cents net per pound for butterfat, at a cost of 2.28 cents for making; in Iowa farmers re-

ceived 28.20 cents for butterfat and cost 1.85 cents per pound to make. In Nebraska the farmer received 23.95 cents. This great difference paid the producer in different states can not be accounted for by any "change in natural conditions" as counsel for the centralizers tried to argue. Had the farmers of Wisconsin been forced to accept the same price as the farmers of Nebraska, they would have had \$4,052,298.59 less money to spend, on the census output of 1905, which certainly speaks volumes for the local creamery system.

In the matter of quality the local creamery best serves the interest of the consumer; the interests of these two classes, the producer and the consumer, are bound up together. The consumer desires good butter and is willing to pay a good price for it; and any system that lowers the quality of butter manufactured will ultimately harm the producer. His interests demand the production of a superior article, and such is the demand of the consumer.

The testimony introduced shows that the centralizer system has rapidly deteriorated the quality of butter so that today the quality in the country is not equal to what it was ten years ago. It has done much in the states when it is seeking to conquer new territory to demoralize the business of the local creamery. The patron of a local creamery who brings to the plant an inferior article, if found fault with, quits the local creamery and sells to the agent of the centralizers who, under the record in this case, was never known to refuse to buy anything in the semblance of cream offered, no matter what might be its condition.

Listen to Commissioner Slater of Minnesota testifying along this line:

"Forced the creamery man to take almost any quality of cream that is brought to him by the farmer. We all know that that is a condition found in sections where we have that competition; that if the butter-maker does not take the cream, the cream agent will. The same thing is true of the other cream agent in the locality. If the farmer wants to ship his cream and one agent will not take it, the other will. The result is that the farmer, who, as a general rule, will produce just as poor an article as he can sell and get a good price for in any way, will take his cream to market and when he knows that he can find a market for it any way, he is pretty poor material to work on in trying to make a good dairyman."

Also Chief Webster of the Dairy Division:

"If this man over here buying cream refuses to take it, and this other man will take it, that is simply putting a premium on bad cream, and that is what has been done all over this territory we are speaking of. That I know to be true from experience as an investigator for the Department of Agriculture, and in my experience in connection with the Beatrice Company; my own personal experience in buying cream in that territory."

In a circular letter issued to the creameries of Iowa by Commissioner Wright out of 293 replies, 243 answered "No" to the following question: "Do they reject any cream on account of bad quality?"

In this case the attorney for the dairy interests, which at first only included Wisconsin, but later Minnesota, South Dakota and Iowa, contended only for a square deal as between two systems.

At the hearings before the Interstate Commerce Commission, the dairy interests had the feeling that while we were allowed to intervene as a matter of record, we were not allowed to introduce the testimony desired to show that our claims were true, as the following would seem to indicate.

Mr. Olin: Now I do not want to take any time here, but they are here (witnesses representing 30,000 farmers in Wisconsin, as well as a large number in Minnesota), and can state the interests represented if the commission and counsel on the other side deem it important.

Commissioner Prouty: I hardly deem that important, Mr. Olin. You have been allowed to appear for them on the record and will be heard upon the argument of the case.

Upon our appearance before the full Commission in Washington, we were allowed but 50 minutes to present our side of this important matter.

The decision which was rendered January 25, 1909, was apparently hailed with delight by the centralizers, for dispatches emanating from Washington claimed a victory for their side and some of the centralizers were reported in the press as being highly pleased with their victory over the local creamery.

As a matter of fact the decision did raise rates from 25 to 33½ per cent over the old rates; and while not built upon a thoroughly scientific plan, is fairly satisfactory to the local interests; it is higher than either the Nebraska or Wisconsin rates.

We do not believe that the imposition of these rates will drive the centralizers out of business, but we do believe that they will change their plan of operations and instead of trying to churn the cream of the United States at one place, will get in close touch with the fields of production by having more churning points.

Believing that at least a partial victory has been won for the local creameries and their patrons everywhere, we feel no hesitancy in standing before you today and asking you to help in some small measure to pay the expenses attending this litigation.

Wisconsin, Minnesota, Iowa and South Dakota have responded nobly. The Wisconsin Butter Makers' at their Convention held last week making a donation to this cause of \$650.00; while previously the creameries had donated \$850.50 while Minnesota has come to the front with over \$800.00, South Dakota \$104.59; Iowa \$256.00; N. Y. \$25.00; No. Dakota \$10.00; Illinois \$255.00. All expenses have been paid except the attorneys. We are owing Judge Barnes over \$800.00 and Mr. Olin \$2,050. With the donation from the Wisconsin Butter Makers' we still have to raise a trifle over \$2,000.

When we are able to pay the debt incurred in this litigation we expect to present, through the dairy press, an itemized report of all receipts and disbursements so that all who contributed, as well as those who did not, can see where the money went to. The officers of the Wisconsin Protective Association have served, to the best of their ability, without any expectation of being reimbursed for their time and trouble; satisfied, and well satisfied, if through their efforts protection has been accorded in some measure to the local dairy interests.

## DISCUSSION.

The Chairman: We cannot take over two minutes, if you have a question you want to ask Mr. Moore.

Member: Which is the proper place to make butter, in the city or country?

Mr. Moore: I wish I had a clipping taken from the Chicago Inter Ocean, in which it was said that Chicago could get along without the manufacture of butter, that the proper place to manufacture a human food so delicate as butter should be out in the country close to the field of production.

Mr. Ketcham: Will the rate be lowered in this state at all?

Mr. Moore: I am not familiar with the Michigan rates or whether your commission waited for the interstate commission to make its decision. In Wisconsin the commission made its decision and decided to stand by it. They made their rates low on short hauls and on long hauls made it high.

The Chairman: Mr. Weld will take a few minutes of the time to announce the scores of the milk. Mr. Weld needs no introduction.

## MILK SCORES.

MR. IVAN C. WELD, DAIRY DIVISION, WASHINGTON.

Mr. President, Members of the Mich. Dairymen's Ass'n:

In the two or three minutes allowed me I shall briefly announce the scores of the winners and the conditions under which they won. Your president has already told you that we are sorry it is not a larger exhibit, and I assure you he is not the only one who is sorry because I came to Michigan this year expecting to find at least forty or fifty samples. You are a little behind the procession in your number of exhibits and I hope another year your conditions will be so favorable that you will be able not only to catch up but perhaps to lead. In Maine this year they had an exhibit of 73 samples, and Maine is at the head of the procession both among the states and nation in the number of exhibits. The total exhibits in this contest were ten, six of which were milk and four cream. The lowest score on milk was 50, the highest was 93; the lowest score on cream was 94½ and the highest 96.

The first prize for market milk was won by Mr. H. F. Probert, of Jackson, 4.7 per cent butter fat, 9.44 per cent solids not fat, acidity was within bounds, bacterial count not over one thousand, a remarkably low record. To be sure it is not quite as low as some of the records made last year. At Battle Creek last year in some of the exhibits there were only two or three bacteria found. The score for flavor in Mr. Probert's milk was 34 out of a possible 40, the composition was 25 or perfect; perfect score on bacteria, perfect score on acidity, very slight deduction on appearance of package and contents, making it 93 points, which wins the first prize.

Number.	Name.	Place.	Fat.	Solids not fat.	Acidity.	Total bacteria. per cc.	Score for					
							Flavor.	Composition.	Bacteria.	Acidity.	Packaging.	Total.
			%	%	%		40	25	20	5	10	100
1	Curtis & Curtis...	Lyons, Mich....	4.25	8.40	20	34,300	35	25	18	5	8.5	91.5
2	J. J. Lawson & Son	Deerfield.....	3.80	8.75	19	830,000	34	24	0	5	8	71
3	H. B. Wastles.....	Troy.....	5.15	8.53	20	75,000	34.5	24	16	5	9	89.5
4	Fremont Creamery	Fremont.....	4.20	8.94	28	3,575,000	25	25	0	0	0	50
5	H. F. Probert.....	Jackson.....	4.70	9.44	20	16,000	34	25	20	5	9	93
6	Leavenworth Bros.	Grand Rapids...	4.25	8.95	20	16,000	34	25	19	5	9	92

Number.	Name.	Place.	Fat.	Solids not fat.	Acidity.	Total bacteria. Per cc.	Score for					
							Favor.	Composition.	Bacteria.	Acidity.	Package.	Total.
			%	%	%		40	25	20	5	10	100
51	Curtis & Curtis.....	Lyons.....	27.75		.162	14,000	36	25	19	5	9.5	94.5
52	H. B. Wattles.....	Troy.....	28.25		.162	9,000	36	25	20	5	9.5	95.5
53	H. F. Probert.....	Jackson.....	32		.18	5,200	35	25	20	5	10	95
54	Leavenworth Bros.	Grand Rapids...	21		.189	4,600	38.5	25	20	5	9.5	96

Now a word or two in regard to two or three samples. I want to say at the start that anything I may say is not in a spirit of criticism, but rather in the spirit of helpfulness and I realize that sometimes, although the truth may not be agreeable, it is very useful in promoting better conditions. I remember an exhibit held at New Hampshire when there was a large amount of sediment in one bottle and as the exhibitor came along and saw that low score on his milk he hardly understood it, was somewhat exercised and when I held the bottle so he could see the sediment in the bottom of it he was a good deal surprised because he did not realize that there could be such a thing as sediment in his milk. His milk was clean, there might be dirt in his neighbors but he did not realize that there could be dirt in his milk, and it was only when the dirt was shown to him that he could be convinced. That man did not get angry and fly around as you might expect some men to do, he took his medicine and came back the next year with an exhibit which was absolutely clean. He had profited by that lesson.

Now there are one or two things here which I am going to speak of and I hope that some of the dairymen in Michigan may profit by the lesson. Here is a jar of milk which perhaps has scored as low as any jar of milk which has ever been exhibited. I am not saying this in a spirit of criticism but rather to teach a lesson. If you will look into the bottom of that jar of milk you will see a condition which is deplorable, to say the least, and I do not for a moment suppose that the man who put that milk up and exhibited it here has the slightest idea that there may be such a thing as dirt in his milk. I do not know how it was produced. We see in this bottle as much sediment as we would ever expect to find in any bottle of milk. I never have seen more sediment in any bottle of milk. So much for that. Another thing in connection with this particular sample was the acidity, 28-100 of one per cent., exceedingly high, and of course entitled to a zero. We could not give it anything but a zero; we could not give it anything but zero on the appearance of the package and contents because the sediment and the other features are undesirable. In addition to that is the general shape of the jar which is not so readily handled as is the more common milk bottle. This bottle scored only 50 points out of a possible one hundred, 25 points out of 40 were given to flavor; it was acid and still it tasted good; there were some objectionable flavors there. It was entitled to a perfect score on composition. That is the part of the milk and cream contest which shows the man wherein he is all right. In composition this milk is as perfect as the sample which won first prize. We give that man credit for everything he has and simply point the way to improvement where deficiencies may be found.

Another thing in connection with this exhibit, here is a very pretty sample of milk, a very attractive bottle; after the cap was put in place you will notice it was sealed with boiling hot paraffine, making the bottle air tight, preventing that cap from admitting dust, dirt or anything that might come in contact with it, and when you send your milk another year to this exhibit bear in mind that a little boiling hot paraffine on top of that cap goes into that cap and covers and seals the bottle; then do not fill the bottle quite to the cap because a little change in temperature may swell the milk enough to raise the cap and cause a leaky condition. Do not fill the bottle so full it will run over.

Another attractive package and, by the way, a package which won first prize, was protected on the top by a piece of ordinary parchment butter paper. These circulars are very inexpensive and after you have your cap in place, if you do not use paraffine, protect the top of your bottle with a piece of ordinary parchment paper. You realize that when that paper is on that rain, dust, mud or anything coming in contact with that bottle is thrown off rather than have it remain on top and finally get inside.

I regret that it has not been possible to have the exhibits properly displayed with the score of cards so they might be studied by exhibitors and visitors and it is because of that fact that I brought these two or three samples here to speak to you on these points which I consider important.

I believe we have as great a future in the milk and cream contests as in the butter contests, and that little score card, which points out the defects in your butter and shows the way for improvement, can also be



a powerful agency in building up the quality of your milk, calling attention to defects in milk and cream and pointing out the way for their improvement. You must remember that we must have good milk and cream, not only for our local markets in cities but for butter and cheese making as well.

I thank you for your attention.

#### DISCUSSION.

Mr. Rozema: Would it not be advisable for the Dairymen's Association to ask every creamery to send a sample of the average milk it gets? For instance, take a small sample out of every lot of milk received at the creamery on a certain day, so as to get an idea of what kind of milk we are trying to make butter from?

The Chairman: It would certainly be very interesting. The next subject on the program, it seems to me is a very interesting one. I am going to ask that it be introduced at this time because I expect it will create a lot of discussion after dinner. "Is it desirable to register grade cows on performance?" that is the idea. It seems to me there is no more important question before the dairymen of Michigan to day than this question. I believe that cows ought to be registered on performance. I do not believe any cow ought to be registered unless she is capable of producing butter fat and milk profitably for the farmer. The most of the breed associations do not pay attention to performance and that is where they make a mistake. It is not proper protection to the people to buy registered or pure bred stock.

We have in this country today a record association, an international consolidated record association, that is prepared to do this work if people deem it advisable. I became interested in this just as soon as we commenced to test cows through the cow testing associations in this state and saw we had some excellent grade cows, just the foundation for building up the dairy industry and the productive capacity of the cows of this state. It ought to be encouraged, we ought to know where those cows are so we can build from them and if we do, in my opinion, we will have a better producing class of cows than we will from the pure bred associations, because they do not take this into consideration.

I became interested in this work and Mr. Rabild and I went to Penn Yan, New York, to look over this International Consolidated record Association, to see, in our opinions, if it was able to do this work correctly and reliably. We investigated it and we believe that that system of recording and that manner of marking animals is superior to anything we ever saw. We therefore asked Mr. Jones, Secretary of the association, to come here at this meeting to bring this subject up, and I am going to call on him now just to state briefly his idea about this, his manner of recording, and while we will not have time before dinner to discuss the subject we will have time afterwards to do it. I will call on Mr. Jones now.

## IS IT ADVISABLE TO REGISTER GRADE COWS ON PERFORMANCE?

HERBERT A. JONES, SEC. INTERNATIONAL CONSOLIDATED RECORD ASS'N, PENN  
YAN, N. Y.

Mr. President, Ladies and Gentlemen:

Mr. Lillie has given you some of our principles, which are based on absolute integrity. I am going to cut this talk short on account of the time for your benefit, because you have many more papers to come before this meeting.

Mr. Lillie and Mr. Rabild, as well as two or three other gentlemen, came down to my place during the last year and looked over our plans. We have had no criticisms from anyone. That is our excuse, gentlemen, for coming here to talk to you. The reasons for it are many. Briefly, they all said that the cow testing associations are in need of more or less assistance. For what? For the benefits it would bring to the farmer, the dairymen, the dairy manufacturer and the consumer. Now all of that is a question that will take considerable time. I would prefer to discuss this by answering the questions which you may bring up after dinner, allowing me to give you any information which may not be clear to you from the rest of the paper.

*The economy and reliability of our work.* We propose to do the work at a minimum expense, and we accomplish that in this way: Your cow testing associations provide you an economical test and the reliability of that work is to be depended upon because it is done by yourselves. We know too that you have your monthly meetings and bring those things before your people, you talk them over; you go into this man's report, have the privilege of looking over his report as it is recorded by the cow tester; each man can question the other man, each man can look into the other man's reliability, know how he is caring for them, etc., and get all the data that is necessary to produce a reliable history of that particular animal.

The standards proposed have been adopted at the committee meeting here the other night, on my arrival, which I believe to be the foundation of good results for Michigan in adopting this standard in grade registration. The standard proposed was as follows:

- For a six year old cow 300 pounds of butter and a calf per year;
- For a five year old cow 275 pounds of butter and a calf per year;
- For a four year old cow 250 pounds of butter and a calf per year;
- For a three year old cow 225 pounds of butter and a calf per year;
- For a two year old cow 200 pounds of butter and the first calf.

If those standards meet your approval I believe you should adopt them here as a body and carry this through and it will regulate the standard at which the animals in the herd that have been tested during the past year can be placed on record and showing you how each particular

animal or each particular herd or number of animals that are there are eligible for record.

In the Newaygo County Dairy testing association for 1907 the record as it is given here and in the pamphlet finally sent me by Mr. Rabild, we find in Herd B of fifteen cows three cows eligible to record under these standards. I will not give you the others but you can easily figure for yourself. The tenth cow in the list only gave 43.2 pounds of butter fat during the period. You will note in the remarks on the outside that she was sold. She should have been sold as a veal calf.

If you propose organizing a cow testing association do not forget the International Consolidated and do it all at one initiation fee. Every man who wants to go into a cow testing association let him provide himself with \$6.00 and get something that will be of lasting benefit to him and his children for eternity. We have this organization perfected to such a business that there is nothing of any sort, no political work, nothing can be promised by any man or any state organization or body of men that can interfere with this standard when it is once adopted, because of two reasons. If your reason is good you will be heard, if it is right it will be adopted after due consideration. We have such safeguards thrown around our management—I am not permitted to explain to you, but if you should come to New York state I could convince you, as I have every other gentleman—that it is beyond any possible doubt of ever being questioned as to the integrity of the work we are doing.

Now, gentlemen, I rambled somewhat last night because I wanted to get you thinking. I have found several men that have done some thinking during the night and some have asked me questions. If I can only come up here long enough to have you listen to me, to give you something to take home with you to think about, I will have accomplished something because I know we have supporters enough that believe in our method that are going to give you something to think about and act upon, and I believe you are going to act because I believe in speaking to an intelligent lot of men as I find in the Michigan Dairymen's Association. It has given me pleasure to talk to you. ~~There is nothing in the world will give a man so much strength as to mingle with the class of people with which he comes in contact. For five years I have spent my time going around the country in this business, simply to be heard, to leave an idea here and there. In New York we have started the ball rolling, we have started it in such a way that something has got to be done. The farmers are asking for it, the dairymen are asking for it, the customers are asking for it. If you have a demand for a product that you can grow on your own farm that you are shipping off it is a good time for you to look after it and see where it is coming from. It is coming from your farm, the gray matter that you have above your ears, as I have heard it expressed, is behind it all. If you find there is no object in selling your veal calf, why do you do it? If that calf is a good heifer calf, convert it into a good cow and place it on registration. You are able to be the man to promote breeding interest in your locality and by a small investment you and your neighbors may put up enough between you to secure a good sire from another cow that has a history, and then you are going to do something. If you breed that sire intelligently upon the dairy cows that you have in your locality each one of~~

you is contributing to the support of that association and the man who takes care of it and you are going to overcome a lot of the defects that you have today, you are going to have pride in your business, and if you have pride in your business there is no doubt about its success. You will get what you please. You need not go any farther than Jackson in your own state, and there is a sample of what is produced in Jackson. Is there not a pride for that gentleman in knowing he can win the first prize on milk? Is it not pride for a man to know he can sell a good grade calf from a cow with a 300 pound record at six years old, and here is an order waiting for that calf at a price two or three times what it is worth as veal. Can you afford to sell your calves produced from your grade sires and your dairy cows here? You can as well originate as you can to follow in the light of somebody's advertising matter. There is no one who can tell you what your results will be. If you have good stock you will have demand for it. You need all the good cows you can breed for the next five years in Michigan.

Mr. Lillie informs me you have 250,000 farmers and seven thousand cows. If you can get 250,00 farmers to place one good cow in the next five years do you realize it will give those cows a history that will create a demand for good pure bred sires that you have here to breed upon your grade cows that you have here? You have to start somewhere and in starting you are only doing what the pure bred people did years ago. They had to take what they found, they had to build on it, they have ignored the farmer's interests. The pure bred interests of this country will not support the babies in the cities. They cannot do it, it has to come to you. You are the farmer, I am the farmer and it is to protect our interests that this work of registration is being done.

The cow testing association work is the only means of securing the information which will make any cow, grade or pure bred, eligible for registration in our record of performance. Remember, gentlemen that we will not take any man's say-so, we will not take any other organization. We have allied ourselves with the cow testing association work so closely that we shall go hand in hand. We cannot part company because we insist on knowing the history of every animal registered, and we are going to keep those records so closely that no power on earth will wipe them out of existence. That history is the beginning of your freedom. When you want a new sire you are looking for the one that has a history that is absolutely reliable. Now it is up to you to decide. We have the means to please you and the ability to serve you so as to gain your confidence and hold it. I thank you.

The Chairman: I want to make an announcement. Mr. E. K. Smith wants to meet the members of the Board of Directors in the adjoining room immediately at the close of this session.

We will now stand adjourned until 1:30 this afternoon.

## FRIDAY AFTERNOON SESSION.

Meeting called to order at two o'clock, opened with piano duet by Misses Wilson and Magill.

The Chairman: We will simply begin where we left off this morning, and discuss this question of the responsibility of registering grade cows or any kind of cows on performance. Has anyone any questions they want to ask Mr Jones?

## DISCUSSION.

Mr. Oliver: I would like to ask Mr. Jones if the matter of feed is taken into consideration? You can make some cows give 300 pounds of butter fat but it would cost perhaps nearly that much to get them to produce it. Other cows would do it more economically. Is the question of feed to be taken into account?

Mr. Jones: From the talk we had at the committee meeting the other night, this became a matter of future consideration. First, to draw out the people who were there we suggested that it is not a matter of feed and that could not come up, so they finally resolved to settle at the present time on so many pounds on the basis of performance without any regard to feed, yet each man keeping a record of his cows just the same. Each man can see for himself what it costs to get 300 pounds of butter fat, because it would be carried out on the same basis on the back of the certificate, the same as each record is; each man will know how much his production cost him and he can use it as a comparison.

You are all familiar with this form used by Mr. Rabild. We propose to carry this out on the back of each certificate for each individual cow. It is certified by your secretary and our supervisor in your county so it has to have the o. k. of both of them before it is entered in our books. There is only one label issued and that particular cow will bear that label, have the label inserted by our representative, and the label or die never comes into the possession of the breeder. It is kept by our representative until he has examined every animal again to see that it is properly inserted and that the contact has taken effect; after that it is returned to us for his certification and placed in our vaults in safe keeping, or to be used in another series when that series of animals is dead. Every thousand animals recorded is a volume. We do not trust to keeping by writing over again and we do not trust to carbon copy unless as we are making a duplicate until to return it to your state department. We do not even wait after we have issued a certificate until this record can come out two years hence but we have sent the subject matter of that performance to your state department showing when this bulletin is published that it is authentic from us. We take another letter press copy in addition that we retain, so there can be no question about it.

The Chairman: Any other questions? It seems to me this system of marking that the International has, of the tattoo die, where the animal is given a number and that is fixed by injecting into the ear, is a safe-

guard for breed of the animals. There is no chance for substitution. It seems to me that is the greatest safeguard I ever saw in connection with registration of animals and that system of keeping shows us much there that can be followed systematically. It costs a little more to keep records when you mark in that way but it is worthy of the extra expense because it seems to me it guards absolutely against frauds.

Member: Do I understand that they calculate the limit for a six year old, that is the least can give to come under this registration is 400 pounds?

The Chairman: Three hundred pounds entitles a six year old cow to registration.

Member: It occurs to me that that is too low, I think that would admit altogether too many cows. If we are going into registration it is for improvement and I do not think we should use anything but the best we have for improvement purposes. I am in favor of making the standard higher.

The Chairman: You look over the records of the 1,200 cows in Michigan and you will find there is none of them can come under that. A cow producing 300 pounds of butter fat in a year is a pretty good cow.

Member: I am willing to wager that out of my thirty cows I have ten that will beat it.

Mr. Jones: I would like to have the report of any of those gentlemen who belong to a cow testing association to take up that work and then base their calculations upon what they find out from that record. We have been threshing this out for ten years and it is only within the last year that we have come to any sort of scale that would be equitable for all parties concerned, and we were waiting for these two reports. When Mr. Lillie and Mr. Rabild visited us last summer that is one of the first questions that came up "Where are you going to start from?" I said "That is what we want you to tell us." The first report they got out was so low we did not think we knew anything about it when we got through talking so we waited for the second report, and then we found out there was a lot to go, gradually about and give people an opportunity to do better. We cannot start you even at 350 pounds of butterfat and do justice to all of you because if we did that there would be too many herds thrown out of existence. Now, gentlemen, we have room to improve and if you are willing to begin at the bottom of the ladder, where we are too, you will gain something.

The Chairman: How much does the Jersey Cattle Club demand for a mature cow in order to make her eligible for registration, how many pounds of butter fat?

Member: Four hundred pounds.

The Chairman: That you see is for registered cows that are supposed to have been bred and selected for generations, and they are only 100 pounds higher than this standard. Of course there are a good many Jersey cows that are coming in under registered mark but there are lots that do not. A cow producing 300 pounds of butter fat in a year is a pretty good animal.

Member: Are the cows that have been tested in the last two years eligible?

Mr. Jones: Yes, you can start immediately, as quick as the papers can be made out and blanks printed.

Mr. Jones: All this association wants to know is that they are reliable authentic tests, that somebody knows the cows made this performance; but you understand they cannot take a private report, not but what all men are honest, but nobody would take any stock in such records. They would say anybody could make records, and so they could.

Member: I have a cow that is seventeen years old, the only one I can give any accurate figures of, and her record is now completed for ten months. She has two months yet to go and has given 25 pounds of milk a day, testing five per cent. Unless something happens, so she will fall down from what she is doing now, on the first of April she will have given over 300 pounds of butterfat in the last year, and she is now seventeen years old.

The Chairman: She is a good cow. I hope all your cows are like that.

If there are no more questions, we will go on with the program.

Mr. Rozema: I beg to submit the following: The Michigan Dairymen's Association, in convention assembled, endorse the idea of registration of grade or pure bred cows on performance, believing it is the basis for successful up-building and economical production, and we recommend that the following standard be adopted.

For a cow with first calf, 200 pounds fat and a calf in one year.

For a cow three years old, 225 pounds fat and a calf in one year.

For a cow four years old, 250 pounds fat and a calf in one year.

For a cow five years old, 275 pounds fat and a calf in one year.

For a cow six years old, 300 pounds fat and a calf in one year.

I move that this resolution be adopted, and also the standard.

Motion seconded, and carried.

Member: Do we understand that it is necessary to become a member of a cow testing association before we can take this up?

The Chairman: There has to be something definite and it must be something besides a private report.

Member: Not necessarily a cow testing association?

The Chairman: Call it what you wish. If a neighborhood will organize and hire a disinterested party to test their cows, that will be sufficient.

Member: We understood this morning there had to be a cow testing association organized to comply with the rules.

The Chairman: There are no particular rules. A cow testing association is a very simple affair. The dairy farmers of a community simply organize into a business association and hire a man to test their cows.

Member: In our neighborhood we could not have a cow testing association. Is there any other way by which I can have my cows tested and registered?

The Chairman: We have not devised any other way.

Mr. Jones That would resolve itself into this. If the whole country is going to adopt a standard method by which this thing can be ascertained, why not all adopt it? If it is good for one section of the

country why not for all? You say you cannot do it, have you ever tried it?

The Chairman: His idea is that dairying is not carried on intensively enough in his neighborhood to warrant the formation of a cow testing association.

Mr. Jones: Those circumstances are exceptional. There may come a time in his neighborhood when enough interest will be created to organize something of this kind. We do not expect you are going home and forget this. That is not what we came out here for. We calculate that you are going to take home something, think about it, and some day some good will come from it.

Mr. Harris: I asked about this cow testing association before. Without the required number of cows in an association, it would cost too much per cow. There might be individuals in good herds that were eligible for registration in this association, but there are not enough cows in the neighborhood to form a testing association.

The Chairman: Mr. Harris, you can get a young man to do that testing, and if there is not enough work to keep him going all the time he can do something else part of the time. That would be a cow testing association and the cows can be tested under the rules of the old cow testing association. If you could hire a local man he could work part of the time at his own business. He could test three or four herds a month, and the rest of the time devote to his own business.

Mr. Harris: What qualifications must a man have to do that work?

The Chairman: Just a man that goes to your farm, weighs the milk and tests it, sees the feeding and figures up per month how much it costs to feed those cows.

Mr. Martin: Is the cost of production taken into consideration?

The Chairman: It is not in the qualification for records. Economical production is the basis of the cow testing associations.

Mr. Martin: But the qualification for registration is what the cows produce?

The Chairman: Yes, but the record will be printed on the back of the certificate, so you will know how much it cost to produce that amount. Profit is the important thing as well as production.

Member: In a creamery district, where there are two or three farmers that want their cows tested, could they have their buttermaker test them, and would that constitute a cow testing association?

The Chairman: It could be arranged so that could be done all right. Yes, Sir. Don't you think so, Mr. Rabild?

Mr. Rabild: Yes, I think it could. As I understand the rules, the county supervisor of this registration would be the party to say whether he would accept it or not, also the state representative.

The Chairman: But if enough patrons of a creamery wanted their cows tested in that way, would it be a cow testing association? If they could get their buttermaker to go to the farms three days in the month would it not be as good as to have anybody else do the work? That would be a cow testing association, just the thing we are talking about. The buttermaker would devote most of his time to the creamery work but he could get out there three days in the month and test those three herds if the patrons could get him to do it. That is what I



told Mr. Harris; if he could get a local man to do this with a smaller number of cows and work at some other business the balance of the time.

Mr. Jones: As I said, Gentlemen, just as soon as you lose sight of the fact that you have to have something official or that you are going to get something official you are going to have trouble. If you take the rules of the association the way we have them, rely upon your dairy and food department and Mr. Rabild, direct representative of the U. S. department, follow out their instructions and carry the thing along in the way they have it organized, it relieves us of the responsibility of your saying we are after the fees. It is not the fees we are after. We want to help you. We are confronted with the same conditions in New York state and we are up against the proposition that have been enforced today had it not been for our quarantine business. We had enough ready to go to work, had our men ready to go into different counties, had twenty-five counties selected, but the quarantine business spoiled our plans for the year; the men who were going into that will not have the time to go into it until next year. It is not that we have to put up much money. We want to help you. We may get five cows in one county, only get five cows for this year, but we will not be discouraged because we have started. We will have something there that is a living advertisement telling about our work. The pure breed men say they are going to continue with their associations but they are going to come with us because they want that record of performance. If they were not willing to do that we could not appeal to them but they say they want it too, so we shall carry a pure breed record of performance and a grade record of performance. Do not get the two ideas confused. Mind you, a grade cow is always a grade cow until she shows you that she is able to transmit to her offspring enough to make her prepotent to go in to a record of pure breeds. My grandfather was a Shorthorn breeder. He bred Shorthorns with seven and eight crosses and called them pure breeds. They were promoting the breeds and after they got where it got into the hands of a few people they said "Here you have to buy these pure bred cows from us, or put up \$100 before you can bring that animal in here. You have to pay us \$100 if you want a pure bred bull" under our system and bring it in to breed on our grade cows, you can ignore that if you want to because it is going into a record of merit and that bull is judged on that record.

The Chairman: To keep this fresh in our minds, we will call on Mr. Rabild to speak on the Testing Associations. I do not think I have to say anything about Mr. Rabild to a Michigan audience of dairymen because you all know him. I take pleasure in introducing to you, Mr. Helmer Rabild.

## COW TESTING ASSOCIATIONS.

MR. HELMER RABILD, ASST. DAIRYMAN, DAIRY DIV., WASHINGTON, D. C.

Mr. President, Ladies and Gentlemen:

The Chairman has cautioned me to be very brief in my remarks. It is not the first time I have appeared before a Michigan audience with the Cow Testing Association as a subject. There is little new that I can tell you today on the subject. There are however a few things that I wish to touch upon because for the last year I have been in different states promoting cow testing ideas.

I find some farmers object to this idea of testing and weighing the milk once a month only. You understand that the cow testing plan is this, that if a community of farmers want a cow testing association they club together and form this association. Twenty-six or thirty men club together for this purpose. It is necessary to have twenty-six men because the tester stays one day in a month at each place, and there are twenty-six working days in a month. Twenty-six or thirty men form an association. The association employs a man to come to the farm of each member once a month to do the testing. This man comes in the afternoon; he takes part in the feeding, weighs the feed and figures the cost; he weighs the milk and then tests it. He does that night and morning twelve times on each farm during the year. The records he gets for that one day are figured as a unit for a period extending two weeks back and two weeks ahead, and in that way the yield is calculated.

When I first went to work with the dairy division, I realized that that objection had to be overcome, that we had to know whether this method of weighing and testing was accurate or not. Therefore I went out to Minnesota, where Professor Haecker has records of his herd for seventeen years. Every milking has been weighed and every milking has been tested for seventeen years. I picked out from those records every thirty days the yield of the cow and let that count as a unit for every day two weeks back and two weeks ahead. In that way I calculated how much the cows gained during the year. Then I went to work and added up the actual performance, as found by weighing every day, and those two figures did not differ but in one instance 4.6 per cent for the milk and 5.2 per cent for the butter in a year; but taking it for a series of years it came within 1 per cent, so that is as accurate as you could have found it by actual weight.

You are familiar with the cow testing idea in this state because the state of Michigan has led the other states in the organization of these associations. We have five testing associations in this state and prospects of having more.

You probably know that my native country is Denmark and I want to take a few moments to tell you what the Danes have done in the cow testing line. Unfortunately from 1848 to 49 Denmark went through a disastrous war. It was declared a victory for the Danes but it cost

a lot of money and it cost a lot of blood. They were trying to recuperate from the effects of the war when in 1864 they were thrown into a new war. This war they lost, not only did they lose the war but they lost a number of their best men and they were deeply plunged in debt. The expense of carrying on this war loaded up the national treasury with a debt which, to use a common expression in those days, extended "up over the chimney tops." That debt had to be paid by taxation. They had to tax their resources. The only resources they had were agriculture. There were no mines or forest, and their only resource was the soil. In other words, the farmers had to fill this bill, had to pay this large national debt. Land is worth from \$500 to \$1,000 an acre and taxes went up from \$2 to \$5 an acre. A great many farmers went bankrupt, they could not pay those taxes. A number came to this country, trying to build new homes for themselves and families, but some remained in the old country, would not leave their old friends and old surroundings and associations, would prefer to starve there. Those men went into dairying. Previous to that Denmark had been engaged in the beef industry, had fed the feed grown upon their farms to beef cows, shipped them to England and obtained good profit; but there came a day when the England farmer thought he might as well raise his own beef so he asked Parliament to restrict importation of Danish beef, and it did, putting quarantine laws into effect which made it compulsory for the Danes to keep the beef three or four weeks in England before it was put on the market, and that took the profit out of the beef business, and the Danish farmer was left with beef cows on his hands with which to do dairying.

It did not take long to realize that if he wanted any profit out of dairying he had to have dairy cows. The Danes tried to import dairy cows from other countries but they did not thrive there because Denmark is a little wind swept country with poor feed, so they gave that up. Then they hit upon this idea of picking out from their beef breed those individuals that showed dairy qualities, bred them to good sires of the same qualities and raised their heifer calves and in that way building up dairying. That was twenty-three years ago, and at that time the average production per cow per year in Denmark was 112 pounds. Today it is 224 pounds. They have doubled the production in 23 years, starting in with beef cows. The average production in this state today is 142 pounds per cow per year. If we adopt the same system the Danes have adopted we ought to be able to do equally as well, because we are starting in with dairy cows where they started with beef cows.

I want to give you the records of one herd over in Sweden. I saw this man last year, called on him and got these records. He swore to them, they were also sworn to by the government expert and are perfectly reliable. This man joined the cow testing association in 1900, at which time he had seventy cows. Those 70 cows gave an average production of 7,320 pounds of milk in a year. That is a good average and you would not think he could increase that very much, and yet he increased in six years to 11,333 pounds. This is the way he did it. He had 70 cows the first year. He found that 28 of these cows were good economical producers; they would take the feed he had on his farm and make it into the most money for him, and those were the cows he

wanted. He kept those 28 cows and kept their heifer calves. The next year he had 46, the next year 51, the next year 54, and so on until now he has the same number of cows and they bring him 4,013 pounds of milk more in the year. That is good business.

I do not think I ought to take up much more time with this cow testing idea in Michigan. We have a number of men here today that are members of cow testing associations and I would like to ask the Chairman to call on them, and have them tell the audience what they have learned through the cow testing idea, if they have any objections to it or complaints in regard to it. I thank you for your attention.

The Chairman: Mr. A. S. Hawley, of Berlin, is on the program to lead in this discussion. He is a member of the North Oceana County Testing Association and I understand has received some benefit from it.

## DISCUSSION.

MR. A. S. HAWLEY, BERLIN.

Mr. President, Ladies and Gentlemen:

It takes all the courage I have to get up here before so many people and tell them that I have fed cows for so many years for my health, it must have been for my health because there was not very much profit. Mr. Rabild told me I was a good herdsman. He called on me one day, went through my stables and looked at my cows and said: "You are as good a herdsman as I ever seen." We got into a buggy and visited a neighbor about three miles north. He had a herd of cows that looked pretty good to me and when we left his farm Mr. Rabild said, "There is a dairyman." I hardly knew whether to be offended or not, but when the cow testing association was formed I was the first member; that is, the cow tester came to my place first and I will try to show you what benefit it has been to me.

In the first place, the cows that I have I raised. I did not keep anything that looked peaked. I wanted nice round fat fellows. Here is No. 1, just as the cow tester found her, and here is just what I was feeding her. This is the first cow the tester tested. Cow No. 1 was tested February 20, 1907 and gave 31 pounds of milk, testing 3.8 per cent, 960 pounds of milk a month, 33½ pounds of butter fat, gave a credit of \$11.86 with a profit of \$3.71. This is what that cow ate that month. She had 620 pounds of hay at \$10 a ton, 465 pounds corn fodder at \$2 a ton, 186 pounds corn and oats at \$22 a ton, 31 pounds oil meal at \$35 a ton, 186 pounds bran at \$20 a ton. The total cost of feed was \$8.15 for one month. I produced butter fat at 22 cents a pound. In January, the same length of time from the time she freshened until this test was made, I found my feed was costing me a little too much so I fed this cow 900 pounds silage, 300 pounds hay; the hay at the same price as before, the silage at \$2.50 per ton; 60 pounds of cottonseed meal at \$30 per ton, 120 pounds Badger dairy feed at \$26

a ton. The cost of keeping the cow this month is \$4.00. The net profit for this month is \$7; instead of costing 22 cents a pound to produce butter fat, it cost 11 cents. One of these sheets is the record for each cow. At the end of the year they were all figured out and each cow has a record which gives the full amount of feed she has consumed during the entire year, the full amount of milk she has produced during the year and the net profit received, also the cost of producing a pound of butter fat.

The next is the first year's report. I will just give you the average and in the next year I will show you that I gained a little. The average amount of milk was 6,115 pounds, 279 pounds of butter fat; the cost of feed was \$41.42, the net profit per cow \$35.08; it cost me 14 $\frac{1}{2}$  cents per pound to produce butter fat. This sheet is the round-up for the next year. The average production is 6,528 pounds of milk, 28,516 pounds butter fat, cost of feed \$38.64, net profit per cow \$40.32. I produced butter at 13 and one fifth cents, leaving a profit of \$2.78 that I saved on the feed and increased the average profit \$5.28 per cow.

Now, here is something I do not like to tell about. Cow No. 5 was milked seven months; her net profits was \$6.24. Cow No. 6 was milked seven months, her net profit was \$7.99. That makes a total of \$14.20 profit from two cows for seven months, so they cut my average profit down. I sold those two cows, one for \$50 and the other for \$45, and I had to put two heifers in their place, one one-and-a-half and the other two years old, to fill out the year.

Here is something I do like to talk about. This cow is a cow that I got at the slaughter house. She was a little too thin for the butcher and he did not want to kill her so he dickered her off on me. I kept her the first year and she made a profit of \$25.72. February 25 she was tested again and she gave 34 and one-fifth pounds of milk per day, one thousand pounds per month; her milk tested 5.4 per cent, that is 54 pounds of butter fat, worth at that time 32 and one-fifth cents, total value \$18.09, total cost of feed \$3.58, leaving a net profit of \$14.51. Here are two cows that I fed seven months that gave me a profit of \$14.23, and here is one cow that I fed twenty-nine days that gave me a profit of \$14.51. The total cost of feed for this cow was \$37.98. She produced 376 pounds of butter fat, for which I received \$105.06, leaving me a net profit of \$67.65. She produced butter fat for ten cents a pound.

That is all I have to say except to thank Mr. Rabild and Mr. Lillie and all the others who have been putting their shoulders to the wheel to help us out of the rut and put us on a better foundation.

The Chairman: We have to be as brief as possible but there are a few others we would like to hear from. We would like to hear from Mr. Reeves, how he is satisfied with the cow testing association.

Mr. Reeves: I am very much satisfied with it, and I advise anybody that goes into the testing association to stick to it as long as he keeps cows. My cows are mostly grade Jerseys. I had ten cows the first year I belonged to the Association and I did not know much about them. Out of those ten cows I sold three. The profits the first year were only \$23.76; last year (1908) I kept sixteen head and have advanced in profit from \$23.76 to \$42.36 in one year per cow. The returns for

one dollar expended this year were \$2.42. The cost of producing one pound of butter fat the first year was 13 cents, and the returns for \$1 expended was \$1.90; the cost of producing a pound of butter fat the second year was 11 cents. I would say that the average test the first year was 3.9, while last year it was 4.8 per cent. I can give you the number of pounds of milk etc., but I do not think that necessary. I sold three of the poorest cows and bought a couple of Guernseys to take their place.

The Chairman: If butter should decline two cents a pound, Mr. Reeves would have made as much profit on his herd this year as last year with the increased price. If butter is going to be cheaper, as they tell us here, it behooves us to have cows that will produce it more economically.

Member: I would like to hear from the farmers.

Member: If there is any farmer here who does not find it practical to join a milking association, I want to remind him a set of scales can be bought for \$2, and the Babcock tester is something anybody can use.

The Chairman: That is true, but the trouble is will the farmers use it?

Member: A good smooth piece of paper and a pencil will keep that record.

The Chairman: We have always advised the farmers to weigh their milk and test it, ever since the introduction of the Babcock test. It has been talked from the agricultural rostrums and has been talked through the agricultural papers, but how many farmers in Michigan are doing it? They can do it but they will not do it.

Mr. Willard: I have been a member of a cow testing association one year and I am now, and I think it is a splendid thing but I think there is danger in one line, I think we give out the impression that butter can be made at a cheaper price. Mr. Hawley just said it cost him in one case 22 cents. As a matter of fact he never did produce it at that cost because items of cost are left out in this cow testing association business. The public gets the idea that butter and milk are produced at this certain price when as a matter of fact it is not a part of the price.

The Chairman: We are not discussing ways and means that have any interest to the public.

Mr. Willard: It will affect our price. If we want a larger price for anything if we can prove to the buyer that it costs us more to produce it they will give more for it.

The Chairman: They will give him more when they have to. They do not take into consideration how much it costs, if they want it they will pay for it. If they can get it cheaper they will do so.

We will have to pass on to the next subject, which is "How to make dairying profitable" by Mr. Clayton Deake, of Salem. Mr. Deake can tell you about a herd of cows that will astonish you.

## HOW TO MAKE DAIRYING PROFITABLE.

MR. CLAYTON DEAKE, SALEM, MICH.

Mr. Chairman, Ladies and Gentlemen:

I did not intend to tell you any story in regard to my own cows. I have simply written a paper here on how to make dairying profitable.

I received a letter from Secretary Wilson last September asking me to give a paper at the State Dairymen's Convention. I was very much surprised that I should be asked to talk on this subject as I have been in the dairy business but a short time. But I wrote him I would do the best I could.

How to make dairying profitable.

This is a subject every farmer and dairyman is interested in. The answer is very simple—feed and care for what you have got and breed for what you haven't got. The average farmer today does not understand how to care for and feed a cow so as to get the flow of milk that she is capable of giving.

I believe that our dairy papers and our public speakers have misled our farmers somewhat in making them think that a large number of our cows are poor cows. I do not think that the fault lies as much with the cow as it does with the man behind the cow. I believe that every man, with the cows he already has can make a good profit if he will give them proper care and treatment and have faith in them.

I would like here to tell you a story I heard at a Sunday School convention—I think it will apply to dairying. The superintendent of a large railroad got an order to move a heavy load of coal over the mountain. He went out into the yards and found a powerful engine all steamed up. He said to this engine, "I have an order to move a long train of coal over the mountains, can you do it?" The engine answered, "Too-heavy-too-heavy." The superintendent went farther down the yards and found another engine. This seemed like a giant in strength. He asked this engine the same question and received the same answer, "Too-heavy-too-heavy." He next came to a little dinky engine used for switching in the yards. He asked this engine if it could carry the load and the engine replied, "I think I can, I think I can." Everything was soon in readiness and the little engine started out with its heavy load. She was working very hard but with every puff it seemed to say, "I think I can, I think I can." As it went farther up the mountain the engine had to work harder but all of the time it kept saying, "I think I can, I think I can." By and by it rounded the peak and started on the down grade. Every puff of the engine seemed to say, "I thought I could, I thought I could." If you go to men and talk with them about feeding their cows they will tell you that it does not pay to feed high priced feeds they will not do enough better to pay for it. "Too-heavy, too-heavy."

I like the man who is willing to face every obstacle and say, "I think I can, I think I can."

How to feed and care for the cow—many farmers just about *half* feed their cows and they do not get any profit from them. Then they claim that the cow is no good.

I will try and give to you my idea of the care and treatment of the cow which can be carried out by any farmer and give him a good profit on the cows he already has. I will begin first with the stable. We should make them warm and comfortable with plenty of light. This need not be expensive. By the use of building paper we can make most any stable warm and with windows we can have light. We should have some ventilation. I think many of us have too much ventilation, that is—too many cracks and crevices for wind and cold to come in. These could be avoided by the use of paper and battings. We should not allow our cows to stand in a draft. We cannot expect any cow to do her best unless she can have comfortable quarters.

We should then keep the stables clean and well bedded, not crowd the cows too much. In fact we should aim to have the cow as comfortable in every respect as possible. When we have done that she is willing and ready to do her part.

Now just a word in regard to the cow. Make her your friend for she is the best friend you have. She works for you 365 days every year for from twelve to fifteen years. Did you ever stop to think what a cow with good treatment would do for you in her lifetime in the value of her product and live stock? About \$1,000. Can you not afford to make her your friend?

But this is not telling you how to feed and care for her. We will start with her as a baby calf.

For the first few days I would give it whole milk—say from three days to two weeks—according to the calf, gradually working it onto skimmed milk. Then I would begin giving just a little cottonseed meal in its milk. This will prevent it from scouring and take the place of the fat that has been removed. Never at any time give the calf more than four quarts of milk at a feed. As soon as it will begin to eat it, give it some hay and a little grain. Dried beet pulp is an excellent feed to make a calf grow. She should be kept growing until she reaches maturity. Breed her so that she will freshen at about the age of two years. For a heifer with first calf I think I would prefer to have her freshen in the spring of the year. After that, in the fall of the year. I like to have them freshen in November. By that time they become accustomed to their winter quarters. I believe we should shut our cows up for winter about the 20th of October and keep them there until sometime in May, allowing them exercise in the yard some time during the day. Give them all the pure water they will drink. Either have it where they can have access to it at all times or water them twice a day. They should be fed and milked regularly. Irregular feeding and milking will cause a heavy loss and cut in quite largely on the profits. The milkings should be twelve hours apart as nearly as possible.

What to feed—Feed a ration that will be economical and yet contain the required amount of protein, giving one pound of grain for every three to three and one-half pounds of milk.

The trouble with most farmers is that they do not give enough protein to their cows to enable them to give the amount of milk they are capable of giving. With so many different feeds on the market one can



select according to price and analysis depending of course somewhat on the roughage he is feeding.

I believe where our dairy farmers lose a great deal is in not feeding the cow good before freshening. I think the grain ration then should be of feeds that do not contain too much fat. The six weeks before a cow freshens is the time to prepare her for her next years work. A great many of our farmers think that when a cow begins to slacken on her milk it does not pay to grain her. I believe you can feed grain to cows with a profit the whole year excepting a short time when you are drying them up.

Now with regard to the breeding—A large number of our dairy farmers are paying no attention to this part of dairying. They think if they can just get their cows with calf that is all that is necessary. Any scrub sire will do. Select the breed that you like the best. Then breed to the best sire of that kind that you can get and stick to it. In a few years you will have a herd of cows that will give you a handsome profit.

Good care, careful attention to feeding and proper breeding will surely make dairying profitable.

Mr. Lillie told you I would tell you the story about making profit from cows and as he has alluded to it, I will tell you about it. I have been in the dairy business for four years. We had to buy all our cows and I bought them from drovers, paying all the way from \$25 to \$40. Forty-five dollars was the highest we paid for any cow. The first two years we had those cows, we made 300 pounds of butter a piece from them, the last two years we have made 400 pounds apiece. My ten cows this year brought us on an average \$116. As we have no cow testing association, I do not know exactly how much it cost to feed those cows, but it was in the neighborhood of \$50 apiece. We have just organized a cow testing association and we will know more about that in the future, but they gave us a net profit of something like \$66 apiece for our cows.

The Chairman: This subject is to be discussed by Mr. Henry Rozema, of Fremont.

#### DISCUSSION.

Mr. Henry Rozema: I was also asked by Mr. Wilson to talk on this subject, and if I understand what discussion means it is as much to criticise the man that has just spoken as to endorse what he said. I like to do both a little. I think he made a very nice talk but I do not agree with him on one point, that is in having his cow or heifer freshen for the first time in the spring. I think it is better to commence in the fall and give the cow a long milking period the first time.

Another thing, he said, as do a number of papers, that we have to give a certain amount of feed to the cows, varying with the amount of milk the cow gives. I think this is very misleading to a man that does not know what is meant. The man that makes the statement is sincere enough but it would make a lot of difference whether you were feeding  $3\frac{1}{2}$  pounds of protein feed or  $3\frac{1}{2}$  pounds of very light feed.

Another thing which he said, of which I do not entirely approve, was that he bought cows of a drover and got 300 pounds of butterfat

from them. He might accidentally do that but I cannot buy cows from drovers that will give 300 pounds of butterfat. I have to raise them. His statement might give an idea that we can just as well go to a drover and buy cows as to raise them. In our county (I will have to tell nearly the truth because there are about a dozen from our county in the audience) I will tell you what they have done. Four year ago the cow testing association was started in our county through the Dairy and Food Department; Mr. Rabild and Mr. Lillie helping us in forming it. We commenced the cow testing association for the purpose of building up and educating ourselves in the dairy business. We commenced it and stuck to it and the longer we are connected with it the more we think of it. I am just commencing to realize the profit in a cow testing association. Some dropped out the second and third year and now they would like to get back into the association. We have at present more members than we can take care of, which goes to show that the older members are receiving some benefit.

Mr. Deake gave the idea that we could buy cows that would produce that amount of butterfat, but we could not do it in our county. The idea in our county is to make dairying profitable, and we consider that a man has to look not only at the amount of butterfat he gets but at the economical production or raising cheap feed. We have learned by the cow testing association not to value a cow only by the amount of butterfat she will produce, but it gives us an education along dairy lines in different ways in the way of feeding; it teaches us how to balance rations and encourages us in work along that line. We get confidence in each other. We are not jealous of each other in the spirit we used to have and if we are jealous we do a little differently than we used.

Since we formed the cow testing association, we have organized a breeders association, and since the advent of the cow testing association our patrons at the creamery are better satisfied. They find that it is natural for the test to vary, and one man along the route who understands that and tells the patrons, will obviate any further trouble in that direction. The spirit of organization has got hold of us in pretty good shape. Last week we organized a County Dairyman's Association and Pea Growers Association. In our town we have a canning factory and we see the necessity of a pea growers association to protect ourselves, so we have organized one and I think a very strong one.

This matter that Mr. Jones brought up here just before dinner seems to fill our needs just right. We think with the cow testing association that we can make more money by getting into this registration that he recommends, in different ways which it would take too long for me to touch on.

Mr. Deake. I would like to make myself clear on a couple of points. In regard to the amount of feed, I said in my paper that we should feed  $3\frac{1}{2}$  pounds of feed to one pound of milk. Of course we would not feed that much of cottonseed, but on a mixed feed, taking into consideration my roughage and then feeding the grain at that rate.

Also in regard to raising our cows instead of buying them; I did not mean by that that we should buy our cows. I believe we should breed our cows but the trouble with a great many men is that they

are selling good cows simply because they do not feed them. I have in mind one cow in particular that I bought from a man who was bringing milk to our place, and I know that man did not get over 200 pounds of butterfat from that cow in the year so he claimed the cow did not pay. He could not get anything out of her and he wanted to sell the cow. I bought her for \$40 and the first year I got 500 pounds of butter from that one cow, but I fed her. It did not, however, cost me much more to feed her than it had him.

The Chairman: We will have to stop this discussion now.

Mr. Smith, Hart: May I ask you to diviate from your program for a few minutes? I would like to submit the resolution drawn by the cheesemakers and buttermakers at a meeting held this morning. It was the opinion of the cheesemakers and buttermakers that they would form an independent organization. We had a meeting at the Livingstone Hotel this morning and the result is we feel that we cannot leave you dairymen; we do not want to leave you. Some of the boys thought we had been slighted at this meeting. I do not think so. I think this has been a great feast and we want to stay with you and come closer to you in order to accomplish better results. I beg to submit, therefore, the following resolution:

To the Officers and Members of the Michigan Dairymen's Association:

Be it Resolved, That we creamery-managers, cheese-managers, buttermakers and cheesemakers, petition your honorable body, asking that you add a section to your by-laws allowing a board of directors composed of one creamery-manager, one cheese-manager, two buttermakers and two cheesemakers to act in conjunction with your board of directors in the arranging of the program for our annual meeting, and auxiliary meetings, allowing us to have our voice in the making out of the program and selection of the speakers, and that we can arrange for hall and program if we wish to hold any meetings separate from the general meeting.

Signed by,

F. W. SHAW,  
E. K. SMITH,  
G. H. GLASSER,  
W. W. THOMPSON,  
GEO. W. SOULES.

I move that this resolution be received and referred to the board of directors of this Association.

Motion seconded and carried.

The Chairman: We have two more papers on the program, besides some miscellaneous business. I am now going to call on Dr. Wm. Delano, Health Commissioner of Grand Rapids, to talk about our score card and scoring dairies. I take pleasure in introducing to you Mr. Delano, of Grand Rapids.

### "OUR SCORE CARD SYSTEM."

DR. WM. DELANO, HEALTH COM'R., GRAND RAPIDS.

Mr. Chairman, Ladies and Gentlemen:

I have been asked to read a paper before your association on "Our Score Card System."

This it would be very hard for me to do as we have only just commenced the scoring of dairies and have not yet been able to get once around. However I will be glad to tell you of the system we are commencing to use and to make a few remarks on the score card system in general as it is applied in various cities.

Up to a comparatively short time ago the inspection of milk in this city was confined to the collection of samples of milk at various intervals and making the ordinary tests for the amount of butterfat contained, or in other words to ascertain its commercial value. This was of course a very superficial method of examination and its value to determine whether the milk was fit for use as food was of course nothing. However, latterly more attention has been given to the milk in its relation to the public health, and the method to be used to improve the municipal milk supply.

Milk, containing as it does all the elements necessary for complete nourishment is a food of universal use. Because of this fact, and also because of its ease of digestion it is a very important factor in the dietary of invalids.

More important than all the rest, it is in such general use as a substitute for mothers milk in the food for every young children that it is at once apparent that there is no portion of the work of a municipal health department than a careful supervision of the city's milk supply.

Grand Rapids was the first city in the state of Michigan to pass an ordinance requiring the tuberculin testing of dairy cattle furnishing milk for use in the city. This ordinance has been in effect for more than a year and it alone has done much to improve our milk supply. The milk supply of our city comes from about seven thousand cows and it is no small task to undertake the testing of these cattle with tuberculin. Coupled with this is the fact that the amount of money appropriated for the work of milk inspection is low and we have not sufficient money to spend for the purpose to supply all the assistance needed by our milk inspector.

Notwithstanding these facts, however, our milk inspector by perseverance and hard work is going over the work with remarkable thoroughness and the effect of that work is quite apparent in the results obtained.

In connection with the application of the tuberculin test our department has recently taken up the question of the scoring of dairies. I believe the first to take up the score card system of dairy inspection was Dr. W. C. Woodard, Health Officer of the District of Columbia. Various cards have been devised for the purpose and the card which

was adopted for use in our department was the one introduced by Prof. Robert Pearson of Cornell University.

The dairies are scored with a possible count of 500 points for a perfect score.

This total is subdivided into five parts each counting one hundred points for a perfect score.

The first division, "Health of the herd and its protection," is subdivided into: First, Health and comfort of the cows, and their isolation when sick and at calving time which counts 45 points.

Second, Location, lighting and ventilation of the stable, which counts 35 points, and Third, Food and water, which counts 20 points.

The second division "Cleanliness of the cows and their surroundings" is divided into cows 30 points, stable 20 points, barnyard and pasture 20 points and stable air (its freedom from dust and odors) 30 points.

The third division, "Construction and care of the utensils," is divided as follows: Construction of the utensils and their cleaning and sterilizing 40 points; water supply for cleaning and location and protection of its source 25 points; care of utensils after cleaning 20 points, and use of the small top milking pail 15 points.

The fourth division, "Health of employees and manner of milking," counts for health of employees 45 points; clean overall milking suits and milking with clean dry hands 30 points, and quiet milking, attention to cleanliness of the udder and discarding the fore milk 25 points.

The fifth division, divided scores for prompt and efficient cooling 35 points; handling milk in a sanitary room and holding it at a low temperature 35 points and protection during transportation to market 30 points.

If the total score is 480 or above and each division is 90 or above, the sanitary conditions are excellent, if 450 or above and each division 80 or above, the sanitary conditions are good. If 400 or above and each division is 60 or above the sanitary conditions are medium, while if the total score is below 400 or any division is below 60 the sanitary condition is poor.

In addition to this we have a blank containing questions as to detail of all the above so that when the inspector or his assistant fill in the answers to all these questions on their card and return that card to the office we are enabled to score intelligently on the dairy inspected.

The value of this system of inspection to any municipality can not be overestimated, as these scores, kept on file in the office, enable us at all times to keep track of the conditions existing and to make suggestions for improvement wherever necessary to do so, and it also enables the inspector to make accurate comparisons between the various places scored and also between conditions found at the same place at different times. This he cannot do without a score card, for even if he could carry in his mind, from one visit to the next a perfect picture of each place, still many might be found to have improved in some particular ways and to have retrograded in others.

It has seemed to me that it would be an excellent idea to give to each producer a copy of his score for I have found that the intelligent dairyman is as anxious to conform to reasonable regulations as are the authorities to have him do so and if he were each time to be informed

as to the results of the scoring it would assist him in keeping up to the requirements.

The intelligent scoring of dairies is perhaps the most important improvement in milk inspection that has been advanced. While the disclosures of the bacteriological laboratory are most important, if we depend upon the laboratory alone without the scoring while we know that a high bacterial count means that there is something wrong it does not inform us as to whether the fault lies in dirty methods practiced or in failure to cool the milk promptly and to keep it cool or whether the fault lies with the housewife after the milk has been delivered. The careless handling of the milk after it leaves the dairyman's control may be and often is responsible for bad milk.

And another factor of great importance is the proper training of milk inspectors. We must have inspectors who are competent to go to dairies and dairy farms and inspect them fairly and intelligently, but we must at the same time have due regard to the human interests involved and endeavor to secure men who will win the respect, confidence and good will of the dairymen. This is to me a very important feature of the work.

And again we must remember that with all the restrictions we are placing about the dairyman with regard to the production and handling of the milk no matter how great may be his desire to co-operate with us and to furnish an article of food which is up to standard in every way, it is a fact nevertheless that the inspiration for every man in business comes from a desire to have the balance on the right side of the ledger.

When I compare the quality of the milk delivered in this city today with that which was furnished a very short time ago I am sure that we are getting an article that is very superior in every way to that of former times. This is also true, that the cost to feed stock has greatly advanced.

Furthermore when we consider the food value in a quart of milk as compared to the food value in a pound of beef it must be admitted that milk is sold at a price that is well below its real value. Good authorities have made the statement that milk produced under conditions that are required by most of our municipalities at the present time for market milk (excluding certified milk from the calculation) can not be furnished to be sold at a profit for less than twelve cents a quart.

However this may be I am sure that there is a market and an ever increasing demand for good clean wholesome milk and that there are plenty of people ready and willing to pay a reasonable profit for it, but the time is surely coming very soon when all market milk must be produced under cleanly conditions and milk will not be permitted to be sold that contains over one hundred thousand bacteria to the cubic centimetre.

The Chairman: We can take just a few moments if anyone would like to ask Dr. Delano any questions about inspection of dairies. If you do not desire to ask any questions, we have one more paper on the program. Professor Shaw did not get here on time. He should have come on before, and now he is like the stranded train, he has lost his right of

way, so he will have to close the twenty-fifth session of the Michigan Dairymen's Association with a talk on Improvement of Dairy cattle. Professor Shaw has been long enough in Michigan now so we do not have to say very much when he stands before an audience of farmers. We all know that he is Dean of the Department of Agriculture in the Agricultural College, that he is doing his very best to put that institution on a higher plane and he has accomplished a great deal so far. We will now listen to Professor Shaw.

### IMPROVEMENT OF DAIRY CATTLE.

PROFESSOR R. S. SHAW, AGRICULTURAL COLLEGE, LANSING.

Mr. Shaw was to furnish a paper but at the last moment failed to do so saying that his talk was along the same line as those found in another portion of the report. See index.

The Chairman: We can take a few minutes to discuss this question. Has anybody any questions they would like to ask Professor Shaw. I think the last thought Professor Shaw brought out, that of feeding dairy cows to the limit, had reference to the profit of the cows, is well worth considering. I believe the cow testing association is practical along that line. I insist that there must be economical production. We take the cost of production into consideration, where as with the other tests they take nothing but the production. The larger they can get it the better. They are working on the same principles there that the trotting horse men are with speed. They do not care how much it goes to get that speed, if the horse breaks down an hour afterwards, he has completed the mile, if he has only trotted in a little less time than some other horse that has made his record and accomplished his purpose, but that is not practical. What we want are dairy cows that will not only produce liberally but profitably, not only one year but year after year and that will be in such condition that their progeny will be able to accomplish even better results. That is the only way, in my mind, to look at that question. Are there any other remarks? If not, we have quite a lot of miscellaneous business to come before this meeting at the present time. In the first place, I want to announce the appointment of certain committees. The board of directors authorized me to appoint a committee on cream standards. I appoint on that committee the following gentlemen: T. F. Marston, Bay City; E. K. Smith, Hart; O. E. Harwood, Grand Rapids.

The board of directors also authorized me to appoint a committee on certified milk standards. I have appointed on that committee: Dr. F. W. Robinson, State Analyst; Dr. Marshall, Agricultural College, and our vice-president Mr. Vanderboom. If he produces milk in the way he stated last night at the banquet he is qualified to act on that committee.

By the new by-laws I am also authorized to appoint a committee on statistics. I will appoint: W. F. Raven; Milo Edison, Leonard Freeman.

Committee on entertainment: C. J. W. Smith, of the Creamery Package Co.; Harry Wattles and Geo. Yetter.

The next order of business will be selection of place for next meeting. I understand there are some people here from Kalamazoo who would like to present their claim for Kalamazoo for the next place of meeting.

Gentleman from Kalamazoo:

Mr. Chairman, we have no formal invitation from Kalamazoo as I came hoping this matter might be settled at this time. I bear with me invitations from the Commercial Club, from the mayor of Kalamazoo, and we all invite you down there. We have selected a slogan down in Kalamazoo "We do," and believe that is the proper thing.

I have looked over what you have here in the way of rooms to exhibit your samples and hold your meetings and I assure you we can give you what will satisfy you. What you have here this year for your supplies is a magnificent room, perhaps better than we could afford singly, but we have two rooms much larger and we can take good care of you.

We have three strictly first class hotels in Kalamazoo, and then we have four or five good hotels at \$1.50 and \$2 a day, and they have all promised not only to do well by you but to make a special rate for you when you come. I am not here to tell you what we will do, I am here to ask "What do you want," and Kalamazoo will give it to you if it is in reason.

A neighbor of ours entertained you last year and immediately they published a little map with a bright spot on it and said "Battle Creek, the brightest spot on the map." If your meeting has that effect on a city Kalamazoo wants it. You know you cannot have all that is good, whatsoever you have that is good give a little to someone else. We are willing to put up for the sake of having you people come to our town and putting us on the map, providing we are off.

The Chairman: It is no more than fair for me to state that I have received letters of invitation just recently from the Chamber of Commerce and Board of Trade of the City of Detroit, also from the mayor and from Mr. Carmichael, who has charge of such entertainments in Detroit, asking the State Dairymen's Association to hold its next meeting at Detroit.

Mr. Rabild: Mr. Chairman, I move that the selection of the next place of meeting be left to the executive board.

Motion seconded and carried.

The Chairman: Now we are ready for the report of the Committee on resolutions. Mr. Vandenboom, I believe, has that report.

Mr. Vandenboom: WHEREAS, There has been introduced into our national legislature a bill asking for the repeal of our present Oleomargarine law, Therefor be it

*Resolved*, That we regard with disfavor any attempt made to repeal, modify or change the law in any way, shape or manner, and we urge our members of Congress to use their best efforts to prevent the same. Be it further

*Resolved*, That the Secretary of this Association be instructed to send to each of our members of Congress, a copy of this resolution.

WHEREAS, The citizens of Grand Rapids have exerted themselves in



an unusual way to make this session of the Michigan Dairymen's Association most pleasant and profitable, and

WHEREAS, The Board of Trade of the City of Grand Rapids have furnished to us an exhibition room and audience room heretofore unequalled, and

WHEREAS, The Citizens' Telephone Company of Grand Rapids have installed, free of charge, telephones, at the Secretary's booth and in this audience room, for our accommodation,

*Be it resolved*, That we extend to them our good will, our thanks, and assurance of our sincere appreciation of the most excellent treatment received at their hands, and the spirit of hospitality that prompted it.

WHEREAS, Dairying and dairy interests are rapidly increasing in the State of Michigan, and

WHEREAS, too many men engaged in the dairy business are milking poor cows, using poor dairy sires, and employing poor methods and thereby obtaining poor results.

*Be it resolved*, That we endorse the action of the Michigan Agricultural College in establishing associations pledged to the use of thoroughbred sires and also of the State Dairy and Food Department and the U. S. Bureau of Animal Industry, establishing co-operative cow testing associations.

*Be it further resolved*, That we, the members of the Michigan Dairymen's Association, co-operate with the State Dairy and Food Commissioners in their efforts to improve the quality of Butter, Cheese and market Milk of this state.

WHEREAS, The dairy supply and commission men have so freely and generously aided us in making our Association one of the best of its kind in America and by the pleasures of the banqueting table, so generously spread, have added so much to the pleasure and good fellowship of this meeting,

*Be it resolved*, That we tender to them our sincere thanks and assurances of our highest appreciation of the kindly spirit that prompted their acts, and

*Be it further resolved*, That there be as many auxiliary meeting held in the future as the funds of this Association will permit.

N. P. HULL,  
F. H. VANDENBOOM,  
WM. H. OLIVER.

On motion, duly seconded, the resolutions were adopted as read.

The Secretary: I beg to offer a resolution at this time.

*Resolved*: That the secretary place the name of Colon C. Lillie upon the list of life members, in consideration and appreciation of his services as president of this Association.

Resolution seconded and adopted unanimously.

The Chairman: If there is no further business the 25th annual convention of the Michigan Dairymen's Association will now stand adjourned.

REPORT OF ENTRIES, SCORES AND PREMIUM OF BUTTER, CHEESE,  
MILK AND CREAM, AT GRAND RAPIDS, FEB. 17, 18, 19, 1909.

	Maker.	Address.	Score.	Class.	Premium.
1	Best Bros.....	Iron Mountain.....	87½	+	.....
2	Chas. D. Morgan.....	Gobleville.....	90½	G. C.....	\$2 89
3	Peter Edinger.....	Fowler.....	85½	G. C.....	.....
4	John P. Urban.....	Bay City.....	89	G. C.....	.....
5	James F. Love.....	Fewamo.....	88½	G. C.....	.....
6	James S. Doten.....	Hubbardston.....	89	G. C.....	.....
7	Joseph Morris.....	Oakley.....	87½	G. C.....	.....
8	F. MacNeill.....	Fostonia.....	87	G. C.....	.....
9	John E. Ross.....	Brown City.....	90	G. C.....	1 93
10	Bay City Creamery.....	Bay City.....	86½	+	.....
11	H. T. Reynolds.....	Lucas.....	89½	G. C.....	.....
12	M. P. Sloop.....	Belleville.....	88½	W. M.....	.....
13	J. F. Phillips.....	Fenton.....	88½	G. C.....	.....
14	E. T. Ferris.....	Henderson.....	88	G. C.....	.....
15	Guy A. Bovee.....	Woodland.....	89	G. C.....	.....
16	W. G. Hoffman.....	Ida.....	90½	W. M.....	2 89
17	E. G. Adams.....	Hilliards.....	94½	W. M.....	10 61
18	Bert G. Peterson.....	Clarks Lake.....	93	W. M.....	7 72
19	Geo. T. Yetter.....	Eau Claire No. 2.....	95	W. M.....	11 58
20	Jesse W. Cobb.....	Lawrence.....	91½	W. M.....	4 34
21	S. R. Miles.....	Buchanan.....	90½	W. M.....	2 41
22	A. C. Siebert.....	Nashville.....	86½	G. C.....	.....
23	W. H. Bechtel.....	Caro.....	91½	+	4 82
24	W. H. Renbarger.....	Glendora.....	91½	W. M.....	5 30
25	J. L. Rosworth.....	Colon.....	90	+	1 93
26	Floyd Hendershott.....	Parma.....	92½	W. M.....	6 75
27	Geo. E. Young.....	Barnum, Minn.....	89	+	.....
28	R. G. Hildner.....	Richville.....	90½	+	2 41
29	Brooklyn Creamery Co.....	Brooklyn.....	90	+	1 93
30	B. A. Hillman.....	Romeo.....	91	W. M.....	3 86
31	T. C. Halpin.....	Vassar.....	90	+	1 93
32	F. A. Chevie.....	Imlay City.....	88	G. C.....	.....
33	Archie R. Pierce.....	Scotts.....	90	G. C.....	1 93
34	Walter Hall.....	Elsie.....	93½	W. M.....	8 20
35	C. E. Renbarger.....	Niles.....	92	G. C.....	5 79
36	Geo. P. Sunday.....	Constantine.....	92½	W. M.....	7 23
37	Volkert Barnes.....	Newaygo, No. 1.....	91½	W. M.....	4 82
38	A. M. Randall.....	Vestaburg.....	87½	G. C.....	.....
39	F. W. Shaw.....	Goodrich.....	92½	W. M.....	7 23
40	Caleb J. Wilson.....	Bauer.....	92½	W. M.....	6 27
41	R. C. Bakkensen.....	Coloma.....	92½	+	6 75
42	Abel Westra.....	Fremont, Box 466.....	91½	G. C.....	4 34
43	L. P. Hansen.....	Bronson.....	91½	G. C.....	4 34
44	O. J. Lyon.....	Waterville, Ohio.....	91	+	++
45	Glen Overton.....	Burnips-Corners.....	92½	G. C.....	6 75
46	A. L. Ferguson.....	Big Rapids.....	88	G. C.....	.....
47	O. A. Ellis.....	Davis.....	92½	W. M.....	6 27
48	C. M. Parch.....	Armada.....	89	G. C.....	.....
49	Clyde H. Stroh.....	Union City.....	92½	G. C.....	6 27
50	Marshall Creamery Co.....	Marshall.....	92	+	5 79
51	C. D. Lockwood.....	Athens.....	90½	W. M.....	2 89
52	Eugene Austin.....	Coopersville.....	93½	G. C.....	8 08
53	H. J. Seibert.....	Allendale.....	90	+	1 93
54	Otto J. Grove.....	Dorr.....	92	+	5 79
55	Fred Schmidt.....	Hanover.....	89	+	.....

No.	Maker.	Address.	Score.	Class.	Premium.
56	F. C. Tanner.....	Bloomington.....	90½	W. M.	2 89
57	L. C. Waite.....	Coldwater.....	93	G. C.	7 72
58	G. W. Schopbach.....	Dowagiac.....	90½	G. C.	2 89
59	J. F. Power.....	Guiney.....	91½	G. C.	4 82
60	C. P. Orrison.....	Springport.....	91½	+	4 82
61	Arthur Bowman.....	Hudsonville, No. 4.....	91½	W. M.	4 82
62	Clarence Walter.....	Remus.....	90	G. C.	1 93
63	F. L. Ferguson.....	Berville.....	87	+	.....
64	Asa D. Steckle.....	Freeport.....	91	+	3 86
65	Bert Siebelink.....	Holland.....	92½	G. C.	7 23
66	R. J. Martin.....	Mulliken.....	89	G. C.	.....
67	J. E. Hebert.....	Peck.....	90½	G. C.	2 41
68	Harry Biersborn.....	Mt. Clemens.....	90½	W. M.	2 89
69	E. M. Fuller.....	Montague.....	90½	G. C.	2 89
70	Andrew Vivian.....	Monroe.....	93½	W. M.	8 20
71	Geo. Myers.....	Reeman.....	91	W. M.	3 86
72	John Vugteveen.....	Graafschapp.....	91	G. C.	3 86
73	John Strating.....	Grant.....	92½	+	7 23
74	Martin Powell.....	Plymouth.....	90	W. N.	1 93
75	Orleans Creamery Co.....	Orleans.....	89½	+	.....
76	E. Schwanbeck.....	Breckenridge.....	89	+	.....
77	Charles Vickstrom.....	White Cloud.....	89	+	.....
78	Geo. W. Sowles.....	Amble.....	89	G. C.	.....
79	Ed Streur.....	Holland.....	91½	W. M.	4 82
80	Edward Winter.....	Port Huron.....	90	G. C.	1 93
81	Henry H. Faber.....	Zeeland, No. 2.....	92	W. M.	5 79
82	Vaold Bros.....	Midland.....	90	+	1 93
83	A. A. Hebert.....	Grant.....	92	G. C.	5 79
84	Arthur S. Nunneley.....	Portland.....	88	G. C.	.....
85	John Kloosterman.....	Clarksville.....	92	G. C.	5 79
86	Charles Bosch.....	Hudsonville, No. 3.....	92	+	5 79
87	H. J. Meppelink.....	Boreulo.....	91½	W. M.	4 82
88	R. C. Austin.....	Deckerville.....	89	G. C.	.....
89	Rudell Creamery.....	Cedar Springs.....	89	+	.....
90	B. A. McGill.....	Traverse City.....	91½	+	5 30
91	Albion Creamery Co.....	Albion.....	91	+	3 86
92	Clyde E. King.....	Concord.....	91	W. M.	3 86
93	Ravenna Creamery Co.....	Ravenna.....	92½	+	6 75
94	R. G. Sortor.....	Hemlock.....	89	G. C.	.....
95	Milton E. Knoll.....	Decatur.....	89	G. C.	.....
96	Red Star Creamery.....	Mariette, No. 7.....	87½	+	.....
97	L. R. Kerr.....	Sandusky.....	87½	+	.....
98	D. B. Ketchum.....	Le Roy.....	93	G. C.	7 72
102	John Batten.....	Avoca.....	88	G. C.	.....
104	C. A. Finch.....	Paw Paw, No. 6.....	90½	G. C.	2 89
105	A. B. Conant.....	Utica.....	91½	G. C.	4 82
106	Clare P. Lutenbacher.....	Woooster.....	89	W. M.	.....
107	John Faber.....	Zeeland.....	91	W. M.	3 86
108	Thos. Netla.....	Reed City.....	88½	G. C.	.....
109	B. F. Hadley.....	Mariette.....	90	G. C.	1 93
110	Galien Creamery Co.....	Galien.....	91½	+	4 82
125	H. Munger.....	Reese.....	90½	+	2 89
123	Wellington Best.....	Grand Rapids.....	90	+	1 93
124	John Schont.....	Zeeland, No. 1.....	.....	W. M.	+++

## DAIRY BUTTER.

	Maker.	Address.			
111	M. J. Griffith.....	Peek.....	88½		
112	Mrs. J. R. Mikesell.....	Charlotte.....	86		
113	Mrs. M. Southworth.....	Vicksburg.....	90		1 93
114	D. P. Miller.....	Almont.....	90		1 93
115	W. H. Oliver.....	Grand Rapids, No. 14.....	92½		6 75
116	P. D. Long.....	Grand Rapids.....	88		
117	Gilbert Harris.....	Dryden.....	91		3 86
118	Mrs. H. C. Taylor.....	Grandville, No. 64.....	89		
119	John Merzman.....	Grand Rapids, No. 8.....	88		
120	Mrs. John Munn.....	Plainwell.....	93		7 72
121	T. B. Crawford.....	Almont.....	90		1 93
122	Milo Edison.....	Grand Rapids.....	91		3 86
123	Mrs. James Harris.....	Traverse City.....	92		5 79
124	Mrs. Ben Seekman.....	Coopersville, No. 5.....	90		1 93
126	Mrs. J. L. Davis.....	Crosby.....	87		

+ Class unknown.

++ Out of State.

+++ Arrived too late.

G. C. Gathered or mixed cream.

W. M. Whole milk.

## PRINT BUTTER.

99	C. R. Renbarger.....	Niles.....			\$2 50
100	W. H. Renbarger.....	Glendora.....			2 50
101	Geo. T. Yetter.....	Eau Claire.....			5 00
103	C. A. Finch.....	Paw Paw.....			

## CHEESE SCORES.

1	M. B. Armstrong.....	Pontiac.....	96	Mich.....	\$5 25
2	L. R. Sigafosse.....	Montgomery.....	94	Soft M.....	3 75
3	H. E. Taylor.....	Tekonsha.....	95½	Mich.....	4 87
4	H. E. Taylor.....	Tekonsha.....	92	Soft M.....	2 25
5	L. Freeman Factory.....	Fenton.....	97	Cheddar.....	*
6	Gar H. Glasser.....	Fenton.....	95½	Cheddar.....	4 87
7	H. P. Fitzpatrick.....	Middleton.....	93½	Mich.....	2 37
8	Wm. W. Reed.....	Perry.....	97½	Cheddar.....	6 37
9	R. L. Ives.....	Greenville.....	95½	Soft M.....	4 87
10	W. W. Thompson.....	Grand Blanc.....	94½	Mich.....	4 12
11	J. G. Dennis.....	Novi.....	93½	Mich.....	3 37
12	J. P. Kaifer.....	Flint.....	97	Fancy Sage.....	6 00
13	J. P. Kaifer.....	Flint.....	95	Mich.....	4 50
14	J. P. Kaifer.....	Flint.....	93	Soft M.....	3 00
15	W. A. Dear.....	Perrinton.....	94½	Mich.....	4 12
16	Wm. Blumlein.....	Frankenmuth.....	96½	Mich.....	5 62
17	Carland Cheese Co.....	Carland.....	93½	Soft M.....	3 37
18	Zeeland Cheese Co.....	Zeeland.....	99½	Cream.....	7 87

\* Cancelled two entries from same factory.

## EXHIBIT OF DAIRY MACHINERY.

The first floor of the remodled Leonard Building was used for the exhibit of Dairy Machinery and Dairy Products. The room had been divided into sixty spaces which were nearly all occupied by exhibitors. It was an ideal place to hold the exhibition, in fact it was the best place that the association has ever had for that purpose. The railings were all erected and the spaces ready for the exhibitors to set up their exhibits and decorate upon their arrival which was much appreciated by the exhibitors. A change had been made in the door way so the Secretary's booth was changed to the left side of the entrance door, aside from this everything worked out about as planned. The spaces were occupied by the following firms:

No. 1. Hoards Dairyman, represented by F. M. Walsh, Circulating Manager who did a rushing business in obtaining new subscribers for that valuable paper.

No. 2-3. U. S. Government Exhibit, Mr. Ivan C. Welds, in charge. This was an interesting exhibit and Mr. Weld was kept busy answering questions propounded by the Dairymen.

No. 4-5. Was occupied by the exhibit of the Farmers Handy Wagon Co., of Saginaw, showing silos and wagons; represented by Messrs. Shipley Stewart, S. S. Rosenberger and Frank Overton.

No. 6. Chris. Hansen's laboratory, Little Falls, N. Y. exhibiting butter color and lactic ferment; represented by Martin H. Meyer.

No. 7. Ladd Bros., of Saginaw, showing the Blue Line ripeners, starter cans, can washers, and Reid's pastuerizers, coolers, cappers and paraffiners; represented by John W. Ladd, G. J. Pullen and J. C. Miller, Jr.

No. 8. Brown & Sehler, of Grand Rapids; represented by J. H. Gingrich showing the Blizzard ensilage cutter.

No. 9. Butler Bottle Co., of Butler, Ohio; represented by L. E. Tigner showing a full line of milk bottles.

No. 10. Kneeland Mfg. Co., of Battle Creek, showing gasoline engines of their own make.

No. 11. Port Huron Salt Co., of Port Huron with a display Isco Rock Crystal Salt, also Triangle table, butter and cheese salt; represented by D. L. Robbins and G. J. Langtry.

No. 12. F. E. & W. L. Hodge, of Grand Rapids, showing milk bottles, cans, pails, trays, cases, caps, brushes, and a full line of dairy equipment represented by Mr. F. E. Hodge.

No. 13. Fitch Cornell Co., 10 Harrison St., New York, N. Y. Commission House and Butter buyers; represented by Porter Fitch.

No. 14-15. Empire Cream Separator Co., of Jackson; represented by F. D. Lake, F. M. Chamberlain, and M. J. Concklin, showing a full line of Empire Cream Separators and Gas Engines.

No. 16-17½ 18. A. H. Barber Creamery Supply Co., Chicago, Ill.; represented by A. L. Covill and E. A. Smith showing a full line of cream

ery and cheese factory supplies, from the largest machines used in a creamery to the smallest bandages used in a cheese factory.

No. 1½ 18-19-20 Creamery Package Mfg. Co., Chicago, Ill., showing Eclipse ripener and pasteurizer, Victor Churn and worker, starter can and paraffiner, Challenge Printer and disc Ice Cream Freezer; represented by A. McCombs, C. J. W. Smith, and J. H. Ladd.

No. 21-40. Vermont Farm Machine Co., of Bellows Falls, Vermont, showing a full line of U. S. Separators; represented by Louis H. Jenns and wife, D. A. Jones, John Licht and W. H. Wilson.

No. 22. Eclipse Box Co., of Grand Rapids, showing milk boxes and washing boxes; represented by J. H. Wiggins.

No. 23. Torsion Balance Co., of New York, N. Y.; represented by Daniel Taylor showing moisture test scales and cream test scales.

No. 24. Iowa Separator Co., Waterloo, Iowa, showing a full line of Iowa Cream Separators; represented by A. E. Leonard, C. A. Miller, and Geo. I. Garrett.

No. 25. C. H. Barrett Co., of Owosso, showing Badger dairy feed; represented by A. J. Balinger and Clayton Deake.

No. 26-38 were vacant.

No. 27. J. B. Ford Co., Wyandotte, showing the Wyandotte Cleanser; represented by Harry M. Smith and H. C. Smith.

No. 28. T. F. Marston assisted by Miss Marion Schafer, of Bay City, showing the Mich. Sugar Co's dried beet pulp and Bowen and Quick stanchions.

No. 29-30-31-32. De Laval Separator Co., New York, N. Y., showing a complete line of De Laval Separators; represented by E. L. Mills, H. C. Timmerman, Joseph Gibson, Bruce Watson, C. F. Cooper and Charles T. Richard.

No. 33. Hunter, Walton & Co., of Chicago, Ill., and New York City, an eighty-two year old butter house; represented by T. A. Somerville, Geo. E. Jenks, and E. N. Bates.

No. 34. New York Produce Review; represented by Robert A. Barry, 173 Chambers St., New York, N. Y.

No. 35. Orange Judd Farmer, New York City; represented by J. W. Stevens and G. F. Crotty, who distributed sample copies of the paper.

No. 36. Omega Separator Co., of Lansing; represented by C. S. Lake, showing what was claimed to be the smallest working model of a separator, also a full line of Omega Separators.

No. 37. Worcester Salt Co., of New York, N. Y., exhibiting the Worcester Salt; represented by A. F. W. St. John.

No. 39. Sun Typewriter Co., of New York, N. Y., showing their New Sun \$40 standard keyboard visible typewriter; represented by W. A. Mudge.

No. 41-61. Sharples Separator Co., of Chicago, Ill., showing a full line of their separators; represented by H. E. McWhinney and wife, Dan Louis and Geo. Lyle.

No. 42-43-58-59. National Creamery Supply Co., of Chicago, Ill., showing Jensen pastuerizer, Davis milk bottle filler, Jensen ripener and a full line of general creamery supplies; represented by R. J. Ellwanger, M. A. Cushman and A. H. Compton.

No. 44. Geo. W. Linn & Son, of Chicago, Ill., wholesale butter merchants represented by Geo. R. Linn.

No. 45. Burnap Building and Supply Co., Toledo, Ohio, Manufacturers of creamery supplies; represented by Jerry D. Lyon and N. D. Kimball.

No. 46. Pettit & Reid of New York, N. Y., wholesale dealers in butter; represented by M. C. Gregory.

No. 47. International Harvester Co., of Chicago, Ill., showing Blue Bell and Dairy make separators and gasoline engines for running same; represented by Chas. V. Marker, and N. H. Graham.

No. 48. Great Western Cereal Co., of Chicago, Ill., showing Mother's Oats and Dairy Feeds; represented by L. R. Hawley and J. E. Williamson.

No. 49. Wells & Richardson Co., Burlington, Vt., showing dandelion butter color; represented E. Sudendorf and F. J. Blood.

No. 50-51. Diamond Crystal Salt Co., of St. Clair, showing a full line of Diamond Crystal Salt for creameries and cheese factories and shaker salt for table use; represented by C. C. Benson, James B. Hill.

No. 52. J. E. Bartlett Co., of Jackson, showing dairy feeds, cotton seed meal and cuddo meal; represented by A. C. McFate.

No. 53. Corn Products Refining Co., of Chicago, Ill., showing corn feeds, Diamond Hog meal, and a collection of samples of the different corn products; represented by W. I. Ziegler, and Wm. H. Radke.

No. 54. Coyne Bros., 161 So. Water St., Chicago, Ill., commission merchants; represented by R. J. Coyne and Fred Bockelman.

No. 55. Colonial Salt Co., Akron, Ohio., showing table, butter, and cheese salt; represented by the Grand Rapids agent Richard Warner, Jr.

No. 56. Wykes & Co., of Grand Rapids, showing a full line of dairy feeds represented by Claude P. Wykes, and Thos. E. Wykes, Jr.

No. 57. Cleveland Cream Separator Co., of Cleveland, Ohio, showing a full line of Cleveland Separators; represented by A. H. Bolter and D. B. Birdsall.

The Secretary's booth was presided over by Mrs. Mabel C. Vickery and Miss Violet Tesch his daughter and stenographer. It was nicely decorated and furnished with a piano upon which Miss E. Marguerite Wilson and Margery Magill interspersed music for the entertainment of the exhibitors and members at intervals during the entire convention.





---

PROCEEDINGS OF THE  
TWELFTH AUXILIARY MEETING  
OF THE  
MICHIGAN DAIRYMEN'S ASSOCIATION  
HELD AT  
TECUMSEH, LENAWEЕ COUNTY, MICHIGAN,  
JANUARY 13-14, 1909.

---



The twelfth auxiliary meeting of the Michigan Dairymen's Association was held at Tecumseh, Lenawee County, Michigan, and opened at 1:30 o'clock Wednesday afternoon, January 13, 1909, with Pres. Colon C. Lillie in the Chair.

The Chairman: We will commence this session with a prayer by Rev. Mr. Shaw.

### PRAYER.

We will bow our heads in prayer. Our Heavenly Father, we thank Thee for life, we thank Thee for the privilege of living in this splendid land of ours; we thank Thee, for our government with all its faults is by far the best this world has ever seen; we thank Thee for the natural resources and riches of our great land and we pray, Oh God, that we appreciate to some extent these many blessings and thank Thee for the privilege of living in this age with all its many improvements continuing and coming nearer and nearer every day. We thank Thee, our Father, for the great and ever increasing number of men who till the soil and who live close to nature and we trust likewise close to nature's God, and we pray that Thou may guide their good understanding of the soil and that we can be best in our work when we are best in our character, and that very same thing applies to every phase of activity, no matter what it is.

We pray that Thou wilt bless this Dairymen's Association, grant that they may be able to transact business in such a way as to please You and that in their papers and discussions along their own line they will learn the best of methods that will lead to the best of success.

We pray, Oh God, that Thy blessing may rest upon our community. We thank Thee that at the present time there is accord in our community, a very stirring religious interest and we know that religious interest, instead of disturbing anything else only gets it down so we can do everything else better if we do it religiously, so we Thank Thee for the character of our work, and we thank Thee in the name of Jesus. Amen.

The Chairman: It has always been the custom of the State Dairymen's Association at the annual meeting, and we have continued that custom with these auxiliary meetings, to ask the town in which we meet to give an address of welcome. This is more to get on friendly relations with the town people. That is what we want in this country, is a more intimate and friendly relationship between the farmers and the town people. That is one reason why I have used by influence to keep up this little formality, as it might be termed, of insisting upon

someone in the town welcoming the Dairymen's Association. I have the pleasure now of asking your village president, Hon. J. H. Combs, to give us just a little talk of welcome.

### ADDRESS OF WELCOME.

HON. H. H. COMBS, TECUMSEH, MICH.

Mr. Chairman, Ladies and Gentlemen, Members of the Michigan Dairymen's Association:

As the Chair suggested, and as I had already intended, my remarks will be very brief, of necessity.

I am sure, Mr. Chairman and Members of the Association, that we are all joined in extending to your Association a most cordial and hearty welcome. Now that stereotype phrase you have undoubtedly heard a good many times in other cities and villages where you have met, but we can go a little farther and change it a little and say "We are mighty glad you are here," and we mean it.

While you are here, those of you who are strangers, if you have the time we would invite you to look at this town. You have perhaps heard that this "is the biggest little town on earth" and we now believe that we have some claims for that distinction. You will remember we have a baseball club which won victory. We also have factories here that I believe will be interesting to you, the fence factory, for instance, on the border of the town, and a magnificent institution that has just been built on the south edge of our city, the beer factory. I might explain that that is not a brewery, we do not want you to call it a brewery, it is a beer factory. It is really one of the finest institutions of its kind and if you have the time we will be glad to have you go down and visit that place.

Of course you have really visited us at the wrong time of the year to fully appreciate the beauty of this little village. Our streets are broad, well kept, we have a great many shade trees, but you have visited us when we are clothed in the somewhat chilly garb of winter, but we think you can see enough to appreciate the natural beauty and advantages of this little town.

We are very glad you are here. We want you to feel perfectly at home and we want you all to have a good time, we want you to go home feeling that you have been most heartily welcomed here and that you can come back here any time you choose. I thank you for your attention.

The Chairman: The Secretary of the Association, Mr. Wilson, is usually put on the program to respond to the address of welcome, but Secretary Wilson informed me that it was impossible to be here. He got these programs printed and he simply changed the name, putting me on to respond.

I want to say that we are very glad indeed to be here this afternoon, very glad of the privilege of holding an auxiliary meeting of our State

Dairymen's Association here in this part of the state. One reason is because I believe that you need us, and another reason is because I believe that if we come here and take part in the discussions we will all receive benefit from it. I am very glad that the mayor has given us such a cordial welcome. He not only means the representatives of the State Dairymen's Association but he means the local dairymen as well, they are all welcome to Tecumseh.

We have not as much dairy enthusiasm in the state of Michigan as the people have in some of the other states of the Union because we have not as much money invested in dairying as yet. If you go up in Minnesota you will see there on every hand that the town people are as much interested in dairying as the country people. It was a surprise to me. I had the pleasure of attending a meeting away up in the Northern part of Minnesota where the town people could not do enough for the farmers. They seemed to have the "glad hand" for them at every turn. They gave them a free banquet at night and the town people came out in large numbers, gave toasts and generally entertained the dairymen. Some of the local dairymen responded to toasts also but the leading people in town were at the banquet. They seemed to feel that it was their duty to take part in this Association, in other words they considered a dairy community a valuable asset to a town. One man up there, in responding to a toast at the banquet, said that they could paraphrase a little rhyme that we all learned when we were boys about

"I want to be an angel and with the angels stand," into

"I want to be a dairymen and with the dairymen stand

A straw hat on my forehead and a milk pail in my hand."

and there is no question but that sentiment is expressed up there. The town people depend upon the dairymen for their trade, the best trade in the world, my friends, for it a cash trade. There is no asking for credit with the man who is engaged in the dairy business. They know that dairying has built up the country and made prosperous farms and prosperous towns, and I believe there ought to be a better business and social relation between the town people in the state of Michigan and the farmers. That is the reason why I am in favor of keeping up this idea of welcoming the dairymen at every meeting we have. We farmers cannot get along without the town people and the town people cannot get along without the farmers. The better business the farmers are in, the more prosperous they are, the better it is for the town. The town people can afford to encourage any branch of agriculture that is going to make the farmers cash customers and put them on a better paying basis. It is as much their duty to do that as it is to advertise goods and they will build up their town just as much, and we farmers might as well live in harmony with the town people and have their respect as well as to be a little edgewise towards them, and I want to see this feeling of good will encouraged all over the state of Michigan.

We are glad to come down here to Southern Michigan to meet with you here and talk over dairy questions, because I believe that Southern Michigan ought to have more money invested in the dairy cow. I believe

it would be for the best interests of all concerned if you will take more interest in dairying. That is the reason why we are glad to come here because we are in hopes that we will create a little more enthusiasm than you have now. We do not expect to come here and tell you people anything new about dairying. There are mighty few new things. You have just as good opportunity as we have, just exactly, to learn about dairying and we did not come here with the idea that we can tell you a lot that you do not know about dairying, but what we want to do is to get you interested enough in this discussion with us that you will have a little more enthusiasm in the business. That is all we want. I do not wish to spend any more time on that.

I want to thank the mayor for his very kind address of welcome. I assure you, Sir, that we appreciate it.

If there was a vice-president of the Association here I would be glad to ask him to preside, but I think with this small meeting this afternoon we can get along without being so very particular as to the formality of who will preside. I want to talk to you a little while about selecting and breeding the dairy cow.

What we are all after in the dairy business is a better cow I think we all agree on that fact. What a man wants who is manufacturing shoes is a better machine to make shoes with and he is looking for it all the time. He is encouraging someone to see if he cannot improve the machine that he already has. What the farmer wants on his farm is better tools, tools that will do more work and not get out of order quickly. Better things. That is what we are after. What the dairyman wants is a better cow because the cow, as a business proposition, is simply a machine for converting large quantities of the feed which we grow on our farms into a saleable product-milk. So we look on a dairy cow largely as a machine. The better machine you will get the better returns you will get from it and we want to remember that.

We are aware, as practical dairymen, that there are a great many poor dairy cows, we know there are some good ones. We know there is a great difference in dairy cows. There is just as much difference in dairy cows as there is in horses. You know one horse is worth \$200 to have on your farm while another, just as good looking, is not worth \$50. There is just that much difference in horses. When you are going to select cows to make improvement it is only good common sense for us in perpetuating our herd to select a heifer calf from the best cows. That is the only way to make improvement. If we select heifer calves from the poorest cows or ordinary cows, it stands to reason that we are not going to make improvement as we would if we selected heifer calves from the best cows. We would expect naturally a calf from a real good dairy cow to make a better dairy cow than a calf from a poor dairy cow.

Now what we want to do in this selection is to find out in some way and transmit the qualities of the good cows. That is important in making a beginning—the selection. Selection comes before breeding. There is no use in breeding a lot of poor cows with the hopes of getting some heifer calves out of them that will be good producers. We might better select out the tares from the wheat and only use the wheat instead of planting them both together. This is the most important

question, is the selection and breeding of dairy cows with an idea of improvement. It is the selection at the beginning, and the question is "How are we going to select?" "Are we going to judge a cow by her looks or are we going to judge a cow by what she does?" There are breeders of registered stock in this country today that are selecting cows more from their looks than from what they produce. Now the question is—are they right or wrong? Are we interested in having a herd of cows in our barns that will be just so, that will all look alike, all of some color, or with the same shaped horns, and all that sort of thing or are we interested in having a herd of cows in our barns that are all good producers, economical producers that will take a large quantity of the feed we grow on our farms and manufacture it into a saleable product?

The results that we get are going to depend largely on the start that we make. That is the selection at the beginning. These later days we have learned to judge dairy cows from a different standpoint or different angle, from a different point of view that we formerly did. It is only a few years ago that we did not have any way of correctly determining the value of a dairy cow. We had to go largely by the appearance of that cow. Since the advent of the Babcock tester, so we can determine the amount of butter fat the cow puts into the milk readily, we have simplified this question of selecting cows a good deal. It is only a little labor for the farmer to determine exactly what the value of a cow is to him, and it seems to me it is along that line that he ought to make his beginning in the improvement of his herd. For I take it that we as practical men, who are trying to make some profit out of the dairy business, are more interested in what a cow does than we are in how she looks. We cannot tell the value of a cow by her looks. A clever man, a man who has a great deal to do with dairy cows, can go out into a miscellaneous collection of cows and can separate the dairy animals from beef animals. He can do that quite readily because there is a great difference in the conformation of beef animals from that of dairy animals, but after you get the dairy animals, those with dairy conformation, into one yard and those of beef conformation into another yard, can anybody go out among those that were put into the yard as dairy cows and select the good dairy cows from the poor dairy cows? That cannot be done, not by the looks of the cow. The only way you can select the profitable cows, those that are worthy to be bred to a good sire for the purpose of perpetuating the herd, is simply to test those cows to find out how much milk they will give and how much butter fat they put into that milk, because that determines the real value of a dairy cow.

There are three things really necessary to know to determine the value of a dairy cow. We have to know, first, the number of pounds of milk that she will give in a year—not in a day, a week or a month; you must know how much she gives in a year because you are obliged to keep that cow a year. Then you have to know how much butter fat she puts in that milk because the value of milk is largely determined by the butter fat which it contains, whether it is used for cheese making or buttermaking or for human food direct. Then we have to know how much it costs to keep that cow because economical production is the final test of the dairy cow. It is like this. No man cares particularly

about doing a large business and getting little or no profit out of it. He might better do a reasonable amount of business and make a reasonable amount of profit than attempt to do a great business without any profit, and so with the dairy cow. What we want to know is the profit that she makes from the food which she consumes. We do not care particularly about having a great yielding cow, a cow that will yield a wonderful amount of milk, or something of that sort, if she does not do it economically, if she does not make us money from it. That is what we are after, so we have to know the cost of feeding the cow as well as know how much milk she produces and how much butter fat she puts into it.

The dairyman can with a little trouble determine that in his own herd and he ought to do it. He ought to weigh the milk of each cow, ought to test that occasionally for butterfat, ought to keep a record of the ration which keeps that cow, ought to give the cow credit for every pound of butter fat she produces in a year and ought to charge her up with every pound of hay and grain she consumes at the market price, and thus find which cows are bringing him a profit. Lots of people will tell you there is no money in dairying. I have heard a great many farmers say there is no money in dairying. They tell you that because they have not investigated it enough to know whether there is any money in it or not. Heretofore it has been a pretty difficult proposition for a man to prove to an audience of farmers that there is real good profit in dairying. I could tell them I made money out of my herd of cows but they would not believe it; they would say "Anybody could tell the story so it would sound as if he made money on them." I gave up the idea of telling anything about my own business because people would not believe me, and I then told them that the State Board of Agriculture, appointed for the state of Michigan, authorized Professor Smith, then Professor of Agriculture, to go into the state and buy a herd of cows, just common cows that he could pick up, bring them to the college and keep strict account with those cows to see if dairying paid. He went out and bought thirty cows and brought them to the college. Those cows cost the state \$39 a head—this was several years ago. He put them in a good dairy barn and gave them a good ration, charged them with every pound of feed they consumed and every minute's time in taking care of them, gave them credit for every pound of butter fat they produced at creamery prices, wholesale prices. The result of this experiment was published in a bulletin by the Agricultural College and spread all over this state. I got hold of one and figured that the state made out of that investment 29 per cent interest on the money invested. That proves that dairying pays. He picked up a miscellaneous lot of cows. I saw the cows there and in my judgment they would not be an extra good herd of dairy cows, yet they made the state of Michigan (under extravagant treatment you might say, it would not cost the average dairyman any where near as much as it did the college) 29 per cent but the farmers would listen to this argument and then tell you the experiment station could do that but the common farmer could not.

Our Dairy and Food Department became so much interested in the Danish Co-operative Cow Testing Associations that it succeeded in organizing one up here at Fremont in Newaygo county, the first co-



operative cow testing association on this side of the Atlantic Ocean. They are numerous over in the intensive dairy regions of the old world but they had never been established in America. We succeeded in organizing one, copying it after the co-operative associations of Denmark. All there is to a cow testing association is simply this, that instead of each man in the neighborhood testing his own cows, as I have been talking about, finding out the number of pounds of milk or number of pounds of fat the cows produce in a year and the cost of keeping the cows, instead of each man doing that they organize an association, a co-operative association and hire a man to do this testing for all the members in the association. That is all there is to it.

We got a Dane who had come over to this county and wanted a job. He had had practical experience in cow testing associations and he did the testing for those people up there the first year. We published the records of that cow testing association in bulletin form, published thirty thousand of them and they were distributed over the state. I don't know how many of you ever saw them but I know they were distributed all over the state. I can tell you something about it and you can verify what I tell you. There were twenty nine herds of cows in this association, something like 240 cows in the 29 herds that were tested. Those cows were charged up, as I have stated, with everything they ate at the market price; hay was charged at \$6 a ton, that was three or four years ago. There have been seasons since then when hay was worth a little more but it was not worth more then, so every pound of hay the cows consumed was charged at \$6 a ton. They charged them with corn stalks at \$4, and I remember in one herd they charged them with carrots at \$12 a ton, that is more than they are worth. If the farmers bought cottonseed meal or oil meal it was charged up at the price they paid for it. They gave the cows credit for butter fat they produced at the creamery prices. There are three or four creameries around Fremont and all the members belonged to some one of those co-operative creameries to which they sent their milk, and the cows received credit for this butter fat at just what the creamery paid for butter fat. Now, my friends, for those 240 cows in 29 different herds that first year it was shown that those farmers were receiving \$1.81 for every dollar's worth of feed which the cows consumed. That shows beyond the shadow of a doubt that there is money in dairying. Instead of a man drawing his hay to market and selling it for \$8 a ton, he sold it to his cows for that price in his own barn and received \$1.81 for every dollar's worth. That is better than selling that hay off the farm. Instead of selling corn stalks, as some people do who live near cities, they fed them to their cows at \$4.50 a ton and received \$1.81 for every dollar's worth of corn stalks the cows ate. This is true of all the rest of the feed.

They found in one herd that the best cow returned her owner something like \$3.20 for every dollar's worth of feed she consumed. The poorest cow gave fifty cents for a dollar's worth of feed. There is a great difference in cows right in the same herd. One cow had the capacity to take this feed, consume it and manufacture it into milk and produce butter fat so that she gave her owner over \$3 for every dollars worth of feed which she ate, figuring the feed at market prices, while her neighbor right in the same barn, taking the same feed, did not have the capacity to give back the price of the feed she consumed, only about

half of it; she gave him about fifty cents for every dollar's worth of feed. This is the point I am getting at. What is the use, if we want to improve our herds, of breeding that cow that cannot give better account of herself than to take a dollar's worth of your feed or my feed and give 56 cents worth of milk? What is the use of breeding her to a good sire and go to the trouble of raising her heifer calf to go back into the herd? So selection in the first place is the important thing in improving the cow. That is nothing but common business sense. You would not want to buy a calf out of that cow to put into your herd if you knew it. The point is, if you do not test your cows you do not know whether you have those cows or not and consequently you cannot make the improvement.

The same is true in the improvement of plants, the corn plant for instance. People will tell you that this ear or row selection of corn has doubled the yield of corn. For instance, you take your seed corn that year and save for next year's planting, and select out say fifteen of what you consider to be the nicest ears. Then you select some place on your farm, you can do it down through the middle of the corn field if you plant it by hand if you desire, but select some place and in one row plant the kernels from one ear, in another the kernels from another ear and so on, having fifteen rows there each one from a separate and distinct ear or corn. They practically all look alike and yet when they grow up you find that here is one row of corn that yields one half more than a row of corn right by the side of it. If I want to make the greatest advancement in the improvement of corn, the only way to do is to select ears of corn, put them in rows by themselves and find the best, saving them for seed. Select out fifteen ears from that respective row to plant in rows next year, then take the balance of that row for your field of corn. In an experiment state they found two rows planted that way, one yielded at the rate of 30 bushels per acre and another by the side of it yielded 90 bushels of corn per acre. Those things are worth knowing. That is of no more interest than where one cow stands side by side with another, while one cow gives \$3 for every dollar's worth of feed and the other 56 cents for a dollar's worth of feed, and when a man knows those things he is absolutely foolish if he selects the corn out of the poor row to plant for corn next year, and he is actually foolish if he selects the calf from the poor cow to perpetuate his herd, but you cannot know these things until you test your cows. That is all I will say about selection. I do not care whether the cow has horns just to suit you or not, I do not care whether she is white where you do not like to see it, I am going to ignore those things for economical production, and I believe that is right. I tell you with the dairy cow it is "handsome is as handsome does" and you cannot look at them from any other standpoint if you want to make the best success out of dairying.

After you have selected the cows that you want to breed to perpetuate your herd, then you come to the question of breed. Now how shall we select a dairy sire? The first thing, is what breed shall we select? I am not going to tell you what breed, I am only going to say if you select one of the four great breeds you will make no mistake. Select the one that you like the best. They have all been bred and selected for generations to consume large quantities of feed that you and I

raise upon our farms and to put that feed into the milk pail instead of into choice cuts of meat upon their backs. I do not care whether you select Jerseys, Guernseys, Holsteins or Ayershires, but I would select a sire from some one of those four breeds and I would select as I told you the breed which I fancy best. If you like Jerseys best you will take more interest in Jerseys, if you like Guernseys you will take more interest in them, etc. Then you select your sires. You want a sire whose dam has been tested and you want to know whether the dam of this calf that you are going to buy was a good dairy cow or a poor dairy cow. There is no use of going to the trouble of selecting the best cows from your own herd and then buy a sire that you do not know anything about the milking qualities of his dam; she ought to be a good cow and she ought to come from a good mother. That is where the value of pedigree comes in. By the pedigree you know something about the dam and the granddam and the great granddam, etc., and then by record you know their value as dairy cows. Get just as good a sire as you can, just as good a sire as you think you can afford to pay for but put his value on performance. I do not wish to lessen vigor, constitutional functions, or anything of that sort, I am taking for granted that we will not buy an animal of any breed that is not healthy and strong and vigorous. We do not want them and we do not have to get them. I am taking that for granted, but I am simply putting stress on performance here because I believe that is the great point to put stress upon if you want to make marked improvement in the quality of your dairy cattle.

I do not know that I can say anything more that is of any great value in regard to selecting and breeding. I could stand here for an hour and describe what I thought was a typical dairy sire but it would not do much good. I have given you a rule that touches the whole question. You never know the real value of a dairy sire until you milk his heifers. I do not care how good a pedigree he has or how many tested dams there are in his ancestors, you will never know the real value of that sire until you milk his heifers because you ought to judge a dairy sire by the same standard that you do a dairy cow, and that is what will he do? If he produces for you dairy heifers that are an improvement on their dams, they are an improvement. That is what you are looking for. They will not all do it, even those that are well bred, those that are from producing dams have not the prepotency sometimes to make the improvement on your herd that you anticipate.

There are poor dairy sires as well as poor dairy cows. They are like that cow that took a dollar's worth of feed and only gave back 56 cents. It is on the same principles exactly, so that of course a man runs a little risk unless he buys a mature sire. If you purchase a mature sire so you will see what he is capable of doing by way of reproduction, then of course you make no mistake, but it is a difficult matter to buy sires of that kind. When a man who understands something about this question gets a sire that is of value he does not part with him for a song, you have to go deep into your pockets if you get him. There are sires that sold this last year at public auction for \$10,000 apiece because people understood their value. If you select a good calf from a good cow and have two or three more good cows back

of him on both sides, you do not run very much risk. He is pretty apt to be good but there is that risk.

The Agricultural College is trying to form cooperative breeding associations in this state at the present time. They have been attempting it for the past year. They want community breeding, they want to organize in this state for instance a cooperative breeding association in every community and divide it into two or three different sections, and have people buy three sires one for each section, each section keeping a sire for two years and then changing with the other section of this breeding association. In that way the people are not breeding all the time with immature sires, young sires. You see after two years there are some heifers that come to milk and you are able to know something of the value of those sires, and if one is found that is not good he can be sold and another one obtained in his place. If two proved to be good there would be a chance to use them in the same neighborhood. The owners of registered cattle have made a great mistake in the past by selling sires before they knew their value. One of the greatest sires in the Jersey breed was slaughtered when he was three years old, Stoke Pogis is the third. He has the largest percent of daughters that have been able to produce 14 pounds of butter or over in seven days, than any other Jersey sire. One man just began to see that there was a splendid sire that was giving splendid heifers and he commenced to hunt him up, followed him up until he finally found him hanging up in a slaughter house at three years of age. If the man who slaughtered him had known his value he could have received almost any price he desired for him. With this idea of breeding in a community, you could with very little cost to any one man test the value of a dairy sire, get rid of the poor ones and keep the good ones, and with a large herd it is always necessary for a man to add new sires to his herd, and he could simply breed a new sire to a few until he found out something of his quality before he used him on a great many of his cows, and in that way test the sire before he has done very much damage.

Feeding comes right along in the practice of unbreeding. We farmers all know that. Someone has said that the breed of the pig is in the corner or the swill barrel. There is a good deal in that. We can take the best bred hog or best bred dairy calf in the world and simply have it amount to nothing by improper and injudicious feeding. You cannot get something out of nothing. They have to be fed liberally and brought up properly and given the proper care or else they will never do for you what you expect. Many people have spent good money for registered stock and became disgusted with it because they would not give the registered stock any show. The greatest mistake made in dairying in the state of Michigan today with the average farmer comes along the line of feeding, and it is not because the farmers do not figure out a balanced ration they injure their cows, but the real mistake comes from the fact that the ordinary man in the state of Michigan today who keeps cows has not faith enough in those cows to feed them all they ought to have to eat. He is afraid he will never get his money back and so you do not want to select the cows out of your herd unless you are feeding them properly and giving them a chance, because there are lots of cows in this state today that are not paying a profit to their owners that would if they were well fed. On

the other hand, there are people in this state today that are feeding too much, over-feeding, you can overdo it. You can feed the cow so much that you cannot get the greatest profit out of her, but the majority of people are not doing that kind of feeding.

What ought a farmer in the state of Michigan feed dairy cows? My idea is that he ought to feed the dairy cow all the clover or alfalfa hay that she will eat up clean, and all the good corn ensilage she will eat up clean every day that he keeps her in the barn. That is the bulky part of the ration, that is the basic part of the ration, clover and corn ensilage. We could go on and talk for half an hour just on those feeds but I do not want to take up the time this afternoon. There are others to come on. You want clover hay because you cannot be good farmers unless you raise clover, I do not care who you are or where you come from. It is not because you get so much free nitrogen from the clover plant that it is valuable either, the greatest good the common red clover ever did or will do is to improve the mechanical condition of the soil, fill it full of vegetable matter, open up the clay subsoil, pump out the phosphoric acid and potash that is below and adds a little to the nitrogen, but the greatest good is to improve the physical condition of the soil, and you cannot keep the Michigan soil in good condition unless you raise it.

Common red clover properly cured is a balanced ration for the dairy cow, so far as feed constituents are concerned, containing one pound of protein to  $6\frac{1}{2}$  pounds of carbohydrates; according to German feeding tables and German feeding experiments that is about the right proportion of feed to have digested and assimilated without loss. That is all there is to a balanced ration. One man says "If clover hay is such a good feed why not just feed the cows clover hay?" The reason is because it is too bulky, a cow cannot eat enough of it. A cow has not capacity enough to consume sufficient food nutrients in clover hay to do her best. That is the trouble. What then is corn silage, that is more bulky than clover hay and does not contain proteins and carbohydrates in the right proportion? That contains 1 pound of protein to 12 pounds carbohydrates, and we ought to have one pound to six or six and a half. When a cow eats corn silage and you attempt to feed her entirely on the corn plant that ration is out of proportion. It is not that the cow will not give a good flow of milk, that she will not do fairly well on it but the point is you are wasting carbohydrates. You are feeding something the cow cannot use, she has to use the proportion of  $6\frac{1}{2}$  of carbohydrates and one of protein, and if you feed her 12 of carbohydrates there are 6 lost. That is all there is to a balanced ration. The cow will do good work by feeding her an unbalanced ration; she will give a good flow of milk but the farmer is losing money, he is not feeding an economical ration. We want corn silage in that ration because, first of all, it is a succulent food and you have to have a succulent food in your ration if you want to get the most out of your dairy cows. A succulent food is of more value than its chemical analysis would indicate because it has a stimulating effect on the gastric juices in the alimentary canal. If you have a succulent food like corn silage that the cows love, more saliva is secured, more gastric juices secreted in the stomach and consequently the cow has more power of digestion, and her ration is better and more economically

digested and assimilated. Then you have to raise corn if you feed cows cheaply because you can raise more tons of cow feed to the acre in the old Indian corn plant than anything we know about. It works in with clover, gives you rotation of crops, gives you a chance to get a thorough intertillage to improve your land.

We have to have corn but those two foods are too bulky and out of balance because corn contains too much of the heat and energy elements of the food, or carbohydrates. What do we want to feed with them? We want some concentrated food, richer in protein than clover hay. That is all there is to the science of feeding. That is all there is to a balanced ration. You cannot balance corn silage and clover hay with corn meal, you cannot balance it with ground oats or ground rye either, or anything of that sort. That would be like carrying coals to Newcastle, they have all the coals they want at Newcastle and there is no sense in carrying more there. So in your ration of clover hay and corn silage you have all the carbohydrates you want, so do not feed carbohydrates or you will waste your money. What you want is concentrated feed, richer in protein than clover hay. What will you feed? You can feed pea meal, if you want to raise your own ration, and there is nothing better; you can grow peas anywhere in Michigan. We sow peas and oats but we put the oats in there because the oats help to hold up the peas and you can harvest the crop with a self-binder and do it cheaper, while oats are a good feed, a little in a ration is a mighty fine thing. Oats is a feed that is better than the chemical analysis would seem to indicate. We raise this feed because we want pea meal which is rich in protein to balance up the corn silage. In that ration, friends, you have an ideal one. You have it balanced so it is not wasted in having it digested by the animal, you can raise it on your own farm if you so desire, and you are doing it economically. Someone figures that he can afford to buy protein outside of his farm rather than raise Canadian field peas. If he can do that it is a paying proposition to do it. You can buy oil meal from the linseed oil mills, you can buy cottonseed meal from the cottonseed oil mills, you can buy gluten feed from the starch factory, brewers grain from the brewery, and all that sort of thing. Those are all by-products. The carbohydrates are all taken out and left behind in the residue is grain which is rich in protein, and we ought to use more in America than we are using. I would like to talk to you a half hour about that proposition, that we Americans are letting the Danish farmer come to this country and buy our concentrated food, take it home and feed it to his dairy cows to enrich the lands of Europe, while we are making America poorer. We American farmers ought to be good enough business men so if the Danish farmers can come here and take those food stuffs and pay the freight over there and compete with us in butter, we ought to be good enough dairymen to use those by-products at home.

I say that is a plain business proposition. If you can buy a pound of digestible protein cheaper than you can raise it on your own farm do it and you can rest assured that when you go outside of your farm and buy cottonseed meal, oil meal or wheat bran and bring it on your farm, feeding it there, that your farm is getting better instead of poorer. That it is as good as it is to buy commercial fertilizer. You can build

up your farm by buying it from the other fellow's farm, feeding it on your farm and taking care of the manure.

There is a great deal that ought to be said about feeding dairy cows. We ought to tell about feeding them regularly and how much to feed them, and all that sort of thing, but we have not time to go into that in detail and I am not going to do it. I shall be glad to answer any questions as well as I can if anyone would like to ask a question. We have a question box and I wish you would make good use of that. I wish you would ask a lot of questions about dairying and about dairy farmers and put them into the question box, and we will try to discuss them. You know the most valuable part of a farmers' institute is the question box. I might talk here as long as you would listen to me and perhaps not say anything that you want to hear. I don't know what you want to know about, but if you ask a question I am sure there is someone here that can answer it.

The discussion of this question is to be led by Mr. D. T. Hall.

#### DISCUSSION.

Mr. D. T. Hall: Mr. President, Ladies and Gentlemen: I hardly know why I should have been put on to discuss this question because Mr. Lillie has covered the subject thoroughly. Think someone should have been selected who could warm this subject up so as to warm this room a little. I do not know why I was selected to discuss this question unless it was that I am one of the few in this vicinity that patronize the Tecumseh Creamery that know what they are doing.

I am not a dairyman, I am only a farmer. I do keep a few cows. Some three or four years ago I said to Mrs Hall, "The time has come when I have to let up on the hard work. I am getting to be an old man. I am not a strong man and I have got to do something that will add to our income, and I know of nothing better to do than the cow." When I bought a separator I was only milking three cows. This last year I milked ten cows, and I figured up yesterday the results I have obtained from those ten cows, and I was astonished myself.

In a recent article in the Breeders Gazette was a picture of a grand, very notable Shorthorn sire and in front of him was a little deer. The little deer said, "My but you are a fine looking fellow." "Yes," said the Shorthorn "So might you be if your ancestors had been selected as carefully as mine have been." I want to say to you that is right where the dairy cow stands today. The one that is giving the profit is the one whose ancestors have been bred to give milk and to give much milk.

I do not quite agree with Mr. Lillie in some respects. In my experience with the cow I naturally wanted a better cow, but I was a poor man. I studied the subject quite carefully. I wanted to decide which was the best breed for me to buy. I decided finally I liked the Guernsey breed. I got that idea from Hoard's Dairyman. I read that paper and found that the people who had Guernsey cattle seemed to be getting good results. I found Governor Hoard himself commenced with the Guernsey cows, getting from them something over 200 pounds of but-

terfat a year, and by careful selection he raised them until they were giving on an average 420 pounds of butterfat a year in a herd of 68 cows. I looked through the advertisement in a dairy paper and I could scarcely find a Guernsey cow or heifer for sale, but finally I found a man who had a heifer for sale. I wrote asking about him and the price. The reply came back and the price was just one dollar a day for every day of her life. I could not buy a Guernsey because I was a poor man. I found the Guernseys were larger than the Jerseys and that they would be apt to have more stamina. What could I do? I did not like the Holsteins, would not have the Ayershires, I did not like their records. What could I do? I decided to improve the cows I had with a good sire. What did I have? Mr. Lillie started right where I am now. I had Shorthorn cows. How could I improve them? Would I buy a Jersey sire, a Guernsey sire, a Holstein sire to put on them? No sir. There was a herd of cows that for thirty-five years had been bred along one line and I said I would stick to that line. I believe that man owns a herd of Shorthorn cows and puts a dairy sire on them, as Mr. Lillie advises, is making a mistake, for I believe that the characteristics of those cattle right through are so prominent that it must result disastrously.

If I were going to start a dairy herd today I would take one of the four breeds of cattle because they have been bred for years and years along the line of milk production, and for the amount of butterfat they produce. I would have a Guernsey or Jersey. I am speaking now if I were going to have a dairy herd and patronize a creamery. If I were going to patronize a cheese factory I would have the Holsteins and I do not like the Holsteins, but to illustrate what it means for a man to follow one line, there is a herd of Holsteins north of Adrain about four miles that last Spring, with eleven two-year-old heifers in the herd that had never been bred, a thousand dollars was offered for the herd and the owner would not accept it.

Two years ago, in 1907, Hoard's Dairyman published a list of herds by number through certain sections of the east. I think there were about one hundred herds tested. They called this a cow census and it was surprising to me to see the herds that did not pay a profit but made a loss to their owners. In one section there were twenty-five herds and twenty-four of those herds were kept at a loss and but one herd gave a profit. Now what is the use in a man keeping a lot of cows feeding them and caring for them, and then at the end of the year find he has lost instead of gained by them? There is one thing I did not do in keeping my record this last year—I carefully weighed every cow's milk every milking, I had every cow's milk tested by a composite sample but I did not keep track of the feed the cows consumed. But those cows that I kept track of during the year had grain the first four months of the year, and yet from those beef bred cattle there was only one out of ten cows that did not give 200 pounds of butter fat during the year. There was one a little two year old milker that only gave milk six months, that is she came in so I only kept the record for the last six months, and she has given 141 pounds of butter fat. There are five cows that are giving 6,000 pounds of milk, one of them 6,700 pounds. The lowest I had was this young heifer and she tested 3.8 per cent; one of the other cows tested 3.9 and from that up to 4.8 per cent.



Mr. Lillie speaks about going out in a herd and picking out the beef type of cows and the dairy type and selecting in that way cows that will do the best. We had two heifers that we called the milkless cows, they were not going to give milk. One of those heifers gave something over 5,500 pounds of milk that tested 4.1 per cent, giving something like 223.1 pounds of butter fat; the other one only came in the 13th of April and I have had her milk up to today and it amounts to 5,680 pounds. She has three months yet to go and 320 pounds to make her six thousand pounds. She has made exactly 250 pounds of butter fat. The average test of those cows has been 4.23, the average price at the creamery for butter fat 26.4 cents. We received from the creamery for those ten cows \$590.89. We have received also during the year for five two year old steers and one calf \$310. Now these cows at \$90.88 have yielded us an average of \$59.09 each, counting them for a full year, and two good heifers, one nine months old and one six months.

Some men say there is not a profit in cows. In all those tests in Hoard's census the cost of feed was averaged at about \$35, so that would leave me a profit of \$24 over and above the cost of feed. I know positively that the skim milk and manure left will pay for the care of the cows. I know that my cows have not cost me \$35 a year for feed but if they have that gives \$24 apiece for each one. Some men think a \$35 cow is as good as a \$60 cow. They object to paying a good price for a cow. If the \$35 cow would only give 100 pounds of butter fat that would be \$26 a year and she would be kept at a loss of \$9 for feed. These cows of mine at \$24 have paid 10 per cent profit on the cost of \$240 apiece, a pretty good price for cows, or at \$60 they have paid 40 per cent profit. Now those cows have simply had farmer's care.

There is another thing in breeding up. I wish to emphasize what Mr. Lillie said, that you must look back at the ancestry not only of your cows but of the sires that you are going to raise heifers from. Not only look to the dam of the sire but even back of that. I am hoping we will do better with our cows. Two years ago I carefully searched to find a sire along the line of what we were trying to do, a sire from a milking strain of shorthorns and I believe we have found him but I believe in trying to better your cows and better the product they are giving. I believe in getting a sire of the same breed as the cows you have. If you have grades, get a sire that will be along the line of the strongest part of the grade blood. You by cross breeding better them but you must follow grade lines.

The Chairman: This question is open for general discussion.

Mr. Wilson: Is there a mechanical device that has been a success as a cow milker?

The Chairman: I think so. I think the Burrell-Lawrence-Kennedy cow milkers are a success. That is my opinion of them. I put them in nearly two years ago, and, while we do not use them all the time, we do use them every year and they do pretty good work. I saw results of the Kansas Experiment Station in testing these same machines on their herds there and they claimed they did better work than the average milker. A machine will not do better work than a good hand milker but if you go into dairying extensively and have to have a miscellaneous

lot of men do the milking you will find that all men are not good milkers and you will find that the milking machine will give as good results as the average milker, your cows will do as well. Mr. Gurler, of De Kalb, Ill., who keeps 200 cows, has had those milkers in his stable for more than two years and he is using them right along. Mr. Gurler has just written a book entitled "The Dairy Farm" and in that he advocates milking machines. That is about all I can say about it. Some cows do not do as well as others with the milking machine. They are different from any other kind of machine because they work on a different product. Of course an ordinary machine works on inanimate objects but here you have a machine that is working on a living being, and you need a good man to run that machine. If you do not you will make a flat failure of it. If you have a good man that gets the idea and is careful and painstaking you will get good results. Two men with machines take the place of five milkers milking by hand any time. I find them the most profitable in the Spring of the year. All our cows are fresh then and are giving milk. We try to have our cows come fresh in the latter part of the summer or early fall, and there are lots that are strippers and it takes as long to put the machine on a stripper as on a fresh cow. You have to hand strip them. You cannot be sure they are milked clean unless you hand strip them. Our men during the late summer, fall and early winter do not think it pays to use the milking machines. In the early fall we have not much milking to do anyway. Later on it is quite a job to milk and when the Spring work begins I shall insist on them using the milking machines. Last Spring I had five men on the farm. Before we commenced to use the milking machines the five men had to milk. We could not get a horse cleaned off before breakfast, they all had to milk. There were fifty cows to milk and all the men had to milk before breakfast and before they got their teams ready to go into the fields it was eight o'clock. Then they had to quit at four o'clock. As soon as we commenced using the machines two men would do the milking and the other three get their horses ready and could go out in the field and do a good day's work. It made a lot of difference in that way.

Member: I was in your stables last year. Your man seemed to think that the greatest advantage of the machine was that it made him so independent, that he could milk the cows alone if necessary.

The Chairman: It took a good deal of worry off me because if one man quit I knew the other could milk the cows. I know that since we got the milking machine we have not had half the trouble keeping good help that we had before, because they know while the milking seems a big job it is done by one or two men, and I believe that has had a good deal to do with it. We have had better men and kept them longer than ever before.

Mr. Wilson: Does it pay to have a milking machine for a small herd of five or ten cows?

The Chairman: I do not think it would. It is not much of a job to milk five or ten cows. I would not bother with a machine. That is just a pleasure to milk five or ten cows. A man can always do that himself but if you are afraid your men are going to quit and you have fifty cows you have a different proposition. In order to have it pay, you have to have three machines so as to keep one man operating a

machine. With a machine you cannot milk as quickly as a good man can milk by hand but one machine milks two cows at a time and one man can run three or four machines, and in that way a man can milk six or eight cows at a time and therefore you gain, whereas with one machine he would set it aside and milk by hand.

Mr. Wheelock: Is it safe to feed cottonseed meal without any succulent food?

The Chairman: Yes, it is safe to feed it without succulent food but cottonseed meal is constipating if you feed too much. It is better to feed it with some succulent food as the balance of the ration. I would not feed too much cottonseed meal with all dry feed, but you can mix it with wheat bran or something of that sort and you can feed it with perfect safety. It is a nice food to feed with corn silage, very nice.

The Chairman: Are there any other questions?

Mr. Seaver: How much cottonseed meal do you think a cow giving 40 to 50 pounds of milk a day ought to have? Cottonseed meal and corn ensilage without any other concentrated food?

The Chairman: I would not go on record as saying how much you could feed.

Mr. Seaver: I am feeding about four pounds a day, two pounds at night and two pounds in the morning.

The Chairman: In the South sometimes they feed as high as seven to eight pounds of cottonseed meal to a cow and it does not injure them. I have fed as high as five and a half pounds and six pounds to certain cows but I would not advise it in a general way. This winter it came about so that I am feeding a highly concentrated grain ration with corn silage and clover hay, but instead of feeding all cottonseed meal I fed one-half linseed meal. We feed meal in the morning and seldom at night. Some people say that cottonseed meal has a bad effect if fed too freely. It is rich concentrated food and you do not want to give a large feed unless the cows are using it all up, gradually increase the ration until you know the capacity of the cow. In a general way we say we do not feed over two pounds of cottonseed meal a day to a cow, feeding the balance in some other ration, yet a good dairyman who understood his business might increase the amount.

Member: Why don't you mix cottonseed meal and oil meal?

The Chairman: I do not see any particular reason of shoveling it all over and mixing it together. Let the cow mix it, it is more convenient to feed that way. What difference does it make?

Member: I think you would get better results.

The Chairman: Why don't you have pancakes three times a day and not just for breakfast?

Member: Because my wife would not bake them. My idea is this—I have had no experience with cottonseed meal, yet it seemed to me the cottonseed meal was rather constipating and the thought occurred to me if you mixed the oil meal with the cottonseed meal you might get better results.

The Chairman: By feeding oil meal in the morning and cottonseed meal at night it will have the same effect.

Member: Do you think four pounds of pea meal is equal to four pounds of cottonseed meal, or how much pea meal do you feed to equal four pounds of cottonseed meal?

The Chairman: Feed about twice as much to get the same results.

If there is nothing more, perhaps we had better leave this and take up the next subject "What a Creamery Ought to do for the Farmers" by Mr. Powers. I believe Mr. Powers is acquainted with you people down here. He is quite a dairyman, besides being a dairy and food inspector. Mr. Powers has been in the dairy business all his life, down in St. Lawrence county, N. Y., from a boy up he has had something to do with butter making and cheese making, and he now owns and operates a couple of creameries up in our part of the state, and while he is not a practical farmer at the present time he is quite a dairy farmer and I believe is well qualified to discuss this question "What a Creamery ought to do for a Farmer." That is the reason I put him on the program. Mr. Powers.

### WHAT A CREAMERY OUGHT TO DO FOR THE FARMER.

MR. E. S. POWERS, STATE DAIRY INSPECTOR.

Mr. Chairman, Ladies and Gentlemen:

The subject assigned to me "What the Creamery ought to be to the Farmer" is rather an old one. I have heard it discussed from the farmers' standpoint for the last fifteen years, but this is the first time I have been called upon to give my views as to what the creamery ought to do for the patron. I have learned the view the farmers take of a creamery from the speeches the farmers have made when I was the audience of one. There were just a few things they could not understand, among them being why one man would get more out of his cows from a creamery than another. His cows were just as good, he knew they were; another thing he could not understand is why the test would go up and down again. Of course he never said anything about it when the test went up but when it went down there was something wrong. Now the speeches I generally returned, in response to these remarks, were generally a little different from this subject, my remarks have always been along the line of what a farmer ought to do for the creamery, so if I become confused on this subject I hope you will pardon me because I am liable to tell what the farmer ought to do for the creamery.

Now I believe there are some things that the creamery ought to do for the patron, not do to the patron because they think they have been done enough now. *What a creamery ought to do for a farmer.* I want to change that a little and say "What the creamery has done for the farmer" and ought to do. I believe there is one thing that the creameries of Michigan have done for the farmer, I believe there is one thing we must give the creameries credit for in a measure, that they have and are preserving a legacy to be handed down to your children and your children's children in the shape of maintaining the fertility of the soil. This question of maintaining the fertility of the soil is so important that it has almost become a national topic and I claim that the creameries

of Michigan have done something towards that, for wherever you find a creamery you will notice the crops in that vicinity are better, the farmers are raising larger crops of all kinds, they have better buildings and the general condition of a dairy community is better in every respect. There is one thing I believe we must give the creameries credit for in doing a large amount of good in Michigan. Over in Wisconsin, which has always been a grain state, the prosperity is so much greater today where they have creameries, and there are four times as many creameries in Wisconsin as in Michigan. I think there are in the neighborhood of 1,200 creameries in Wisconsin and only about 300 in Michigan.

Another thing that I believe the creamery should be given credit for it is that it has been an educational factor to the farmer, an educator in the way of building up a better herd of cattle, as Mr. Lillie said in his talk today. I have seen it in my own locality. When I first started my creamery ten or fifteen years ago the farmers did not understand the dairy business. They only looked at the creamery end of the business and expected the creamery would bring them all the profit. They had not commenced to study why it was they could not make a profit out of their cows. There is one thing I think the creamery ought to do, it ought to encourage the farmers, where there is not a testing association as is the case in my neighborhood, to test their own cows. I believe if a farmer will take the trouble to bring samples of milk to his creamery, that the creamery manager or buttermaker will be willing to test that milk. I know I did that and I believe it did a lot of good, it got the farmers to thinking, it got them to throw out the boarders, as you might say, from their herds, and it has made a wonderful increase in the amount of money they received from those cows in a few years. Up in that locality now they have a testing association, which is better because it is true in most cases that a farmer will neglect to weigh and test his milk. He does not like to do it. I urged my patrons to test their own cows, to bring me a sample, and I even bought a tester and in the afternoon would go out to some of my patrons that I knew were not making any profit out of their cows, help them milk and weigh their milk, figure out the weight of each cow's milk to show them that they could not possibly make any profit on the cows they were milking. That is one thing a creamery ought to and generally is willing to do.

I say the creamery is an educator. You cannot have a creamery unless you are interested, unless you get a little enthusiasm in the dairy business. You must have confidence in it, have confidence in the dairy cows and then I believe the creamery is an educator in such a way that if you have some cows and have boys you can give those boys an interest in those cows. When I was a boy I could not get interested in cows. I thought the worst job a boy was ever put to was to go out and milk cows and take care of them, but there was one thing I did get interested in and it always did me good, and that was the way my father took care of his cows. I could see that was about all he knew in regard to them, he did not know much about the individuality of the cows but he pursued that routine way of saving the calves from the best cows but there was nothing further that would really interest a boy. The dairymen of today in many cases have interested their boys because they have taught them from the beginning to find how much improvement

they make from year to year on their cows, how much they could make those cows produce, whether she was producing more one day than she did the day before. Things of this sort attract the boys attention and make him interested, and we have to do something to get a boy interested in the farm.

In the country where I live the farmers are just sort of convalescing, that is, they are just getting over the lumber business, and it takes fifteen or twenty years to get over it. They cannot get over the habit of getting their teams out, rubbing up their sleighs, getting a red smock and red socks and going out to the lumber woods for wood. They cannot get over that and their boys were brought up on that same training; they see their fathers do this and they are doing the same thing every day. They cannot get over the habit. Those boys on their fathers' farms cannot go into the lumber woods now, so what are they doing? They are drawing hay, drawing gravel, working their teams all winter long. They are not satisfied unless they are out driving their teams. As soon as a boy is big enough to go on a load of hay he will take a load of hay down to Muskegon. The boys like to get on a load of hay and drive down to Muskegon. What do they do there? They drive their hay to the market there, put their horses in the livery barn and then go to the livery office and stay there one or perhaps two days waiting to sell the hay. There is a deck of cards in the office and it is natural that the boys should want to play, while right across the street is a saloon. Those boys go in there and play smear and games of that sort. They like it. They like to bring their hay to Muskegon because they can play smear and have a good time. This winter I have known farmers to go to Muskegon and stay three or four days before they could sell a little load of hay that would bring \$8 or \$9, and I believe if we can get the farmers interested in some other line of farming, whether stock farming or dairy farming or something that will be of interest to the boys and show them there is an interest in farming, that we will be doing a great deal of good for the entire state. I believe it will have better influence, will keep the boys on the farm and make them more content.

The creamery is certainly a good market. We all know what the butter market was in Michigan ten or fifteen years ago. I heard Mr. Lillie not long ago tell a story of his experience in that line when he was a dairy farmer. He took some butter to sell in Grand Rapids and he went around that town all day long but could not sell the butter. Finally one grocer agreed to give him 8½ cents a pound for it if he would take it out in trade, and I suppose he thought he would be about as mean as he could so he took it out in granulated sugar, and the grocer was so put out about it that he was sorry he took the butter because M. Lillie traded it out in granulated sugar. Ten or fifteen years ago you did not get cash for your butter, so you can see what the creameries have done to make a good market, to make it on a commercial basis. You can now send your milk to a creamery and have it converted into butter at the highest market price. Although the manufacture of creamery butter has increased very rapidly in Michigan, and in fact all over the United States, still the price has gradually climbed until today it is worth 32 cents, while ten years ago it was worth fourteen or fifteen cents a pound in June, and there is no limit to the dairy opportunities.

As Mr. Lillie has told you, I was born in the Northern part of New

York, where the principal business was cheese making, every three or four miles there was a cheese factory. Those factories are nearly all closed now, especially those away from the railroad. A milk train goes up into the Northern part of the state and carries train loads of milk clear into the city of New York, and a man with whom I was talking not long ago said they would not only come to Michigan after our butter but they would come for milk to supply the eastern markets. There is no limit to the future of the dairy business.

I do not know that I can say much more. I would like to hear this subject so as to get some benefit from it. It is a subject that should be of interest to a community like this and I believe that the creamery ought to do and does do a great deal for the farmers.

The Chairman: The discussion of this subject is to be led by Mr. Birdsall.

#### DISCUSSION.

Mr. T. M. Birdsall: Mr. Chairman, Ladies and Gentlemen: I think perhaps this is a little one-sided to put this subject into the hands of two creamery men. Personally I would like to have heard from the other side.

There are some things that I think the creamery should take into consideration and some duties perhaps that they owe to their patrons and I think where we are located in a community or locality and buy the cream or milk, whatever the case may be, that it is our duty to be up-to-date with our patrons and with our methods, so that the farmer may feel when he comes in with his product that it is going to be handled properly that he may realize the full value from it.

Then as to the educational feature. I hear a great deal about the creamery being a sort of educational institute or a dairy school. I do not know that that is exactly the right term to give it, but I do believe that I am in a position to gather a great deal of data perhaps along the feeding line that the farmer does not have a chance to do, as we meet more people and they come to us with different rations, different ideas and want our suggestions. I personally have been spending some time recently studying this up that I might offer suggestions that were helpful and perhaps accurate along this line, giving some attention to the comparative value of our cow feeding rations, etc. The silo question is coming up in our locality more and more all the time and I think that it ought to be the duty and privilege of the creamery to give some suggestions along that line. We ought to know something of the benefits derived from the silo and something of the expense necessary to erect a silo. I think this locality needs more silos. We have only a few. I do not know just how many, perhaps you could count them on your fingers, and I am sure they would be of great benefit if our patrons knew just what they cost and just the value of them. There is no question in my mind but if they knew these things there would be more silos in this locality in a short time.

I do not know that I have anything more to say. Perhaps some of these patrons could give me some suggestions. I would like to hear from them.

The Chairman: This is open for general discussion. Would anyone like to say a word on the subject as to what the creamery ought to do for the farmer? I wish I knew you people by name so I could call on you. Mr. Hall what do you say on this subject?

Mr. Hall: I think the patrons of the creamery do not find fault so much with the creamery because they are not up-to-date but because they think they are not up to weight. I have patronized the creamery here for quite a number of years. Sometimes I have been deceived but I believe the man who is least satisfied with the creamery is the man who keeps a few cows and the man who keeps poor cows. The more I deal with the creamery the better satisfied I am, and I want to say that I believe our creamery here is doing its best to deal fairly, squarely and honestly and for the best interests of its patrons and the better understanding between the creamery and the farmers is to the benefit of both sides concerned.

The Chairman: Has not someone else an idea that he would like to bring out on this subject? I do not believe it has all been covered yet.

Dr. Robinson: I would like to have someone tell us something about the local creamery here, how it pays its patrons, and give some that are not perfectly familiar some points.

The Chairman: Would you suggest the manager of the creamery, Mr. Birdsall? Mr. Birdsall, that is putting you on the carpet.

Mr. Birdsall: Our methods here are simply to buy the butterfat and pay Elgin quotations delivered at Tecumseh. We have three stations and at those stations we pay one cent less, the difference being to pay for the expense of maintaining the stations. Where we have routes we calculate to make reduction on routes to pay for the drawing. That seems to be necessary. When the patrons were on the milk basis the cost of transporting milk was altogether too high; it cost the patron about 25 per cent of the value of his product to get the stuff in here. Now we have transferred, or rather the farmers have done it themselves, changing to the hand separator system and it has done away with a great deal of that expense, so that in the last twelve months we have increased our business 100 per cent.

The Chairman: Do the farmers haul their own cream?

Mr. Birdsall: We have only one team on the road drawing cream. Each farmer delivers individually, brings it either here or to the station.

The Chairman: How often do they deliver that cream?

Mr. Birdsall: At one station we take it in three times a week, at the other only twice. Here at Tecumseh we take it in any time in the day or any day except Sunday.

The Chairman: Is it not rather expensive for the farmer to take in his individual product?

Mr. Birdsall: I do not believe we have a patron delivering cream three times a week now, generally speaking they deliver twice a week, but some of them only bring it once a week.

The Chairman: Would it not be cheaper for the community if they had one man who made it a business to collect this cream, rather than have each individual farmer drive over the road to bring in his product? One man could bring in the product of the whole neighborhood. Would not that be cheaper?



Mr. Birdsall: We have that idea carried out in two localities that I know of but I do not know the way it is delivered here in town. The patrons are coming to town often.

The Chairman: Do you allow them to come with their cream after supper.

Mr. Birdsall: All they have to do is to hunt us up and if they do that we will take in their cream. We do not take this cream that explodes, you know.

The Chairman: If your cream all came in regularly, say on two or three particular days a week, and if you knew it was all coming in then and you were going to get it at a certain time, could you not take better care of it than to have the cream coming in a few cans at one time and a few cans at another?

Mr. Birdsall: We do not make much of an attempt to take care of the cream. We churn it up as fast as the cream comes in. We churn every day except Sunday.

The Chairman: What I mean is this, supposing you had regular days for receiving, say Tuesdays and Fridays. If the cream in this community came on Tuesdays and Fridays and you knew it was going to come, could you not be prepared to take better care of it? Would it not be of more benefit to you than to have some deliver on Monday, some on Tuesday, and so on through the week?

Mr. Birdsall: Possibly it would make less work for us. Our aim down there is to handle it to suit the convenience of the patrons largely.

The Chairman: You are after business.

Mr. Birdsall: We are after business but we do not hold anything over, that is of course with the exception of the cream that comes in after we are through pasteurizing. If three or four cans come in then we hold them until we get a sufficient quantity to pasteurize, but we churn every day except Sunday.

The Chairman: I would like to have an expression from the patrons as to what they think would be best for them. Suppose this creamery would hire teams and send them out on the road on regular days to collect cream and they charge the farmers one cent or a cent and a half a pound for butterfat, would it not be cheaper for the farmer than it would to have each farmer deliver his own cream? I understand, of course, that some farmers do not think it costs anything if they deliver their cream themselves because they do not have to pay out anything, but farming is being more and more figured as a business, and a farmer figures his time as worth a certain amount the same as the business man does. It costs something to hitch up in the morning when you have something else to do, to take cream to the creamery. Which would be the more economical, for the whole community to have regular men and teams to go out and collect this cream and bring it in regularly, or have the individual farmers haul it in themselves?

Member: If we were to patronize the creamery right along I would prefer to have it drawn in.

Member: I am on one of the routes where the cream is gathered and it costs two cents a pound to get it hauled. That is high for me but I know a good many that prefer to take it themselves because, as Mr. Birdsall has stated, they can take it down any day and almost every

week they are in town on some business or other, so they prefer to bring it themselves especially at this time of the year. There is also a station close by me where we can take it for one cent a pound less, and I believe the creamery arranges to gather the cream in a community where the farmers do not wish to deliver it themselves. The route I am on covers thirty miles. The driver starts from my place in the morning and is gone all day but he gathers cream for a large territory, and I think where there is enough cream, if the farmers do not want to take it in themselves, the creamery has made an effort to get it. I think the people who bring in their cream prefer to do so.

Another thing, while I do not know the amount of butter they churn down here, I do not believe that they can conveniently handle what they get and churn it two days a week. Mr. Birdsall says they are now churning every day except Sunday, and if it comes in on two days it would bother them to handle it all there and the next day churn. They do a large business and I think it is more convenient for the patrons to do as they are doing. Wherever a number of farmers wish to send their cream in and pay for the establishment of a route they will pay to get it hauled in.

Dr. Robinson: That is one of the points I was trying to get at, that is does not that policy work to the detriment of the butter because farmer A does not always come to town on the same day of the week and so is he not inclined, when he knows he is going to town next week, to save his cream for two or three days and bring it in? I think Mr. Birdsall would find a difference in the quality of his products if his cream was brought in regularly.

The Chairman: I think perhaps he would too, but what I wanted to bring out was these are the two systems we are working into of delivering our cream. Some farmers want to take in their own cream and others want to have some one haul it for them. Now if you are going to haul by team everybody ought to agree on that method and have it done in a systematic way, because if one bunch of men take in their cream and the creamery has to send out their teams to take in cream from another man that does not want to haul, you cannot haul that cream as cheaply as you ought. If you all patronize the regular cream routes you can have your cream brought in for one cent a pound; while where part of you bring it in and the team has to cover a long distance you cannot afford to do it for two cents a pound. That ought to be taken into consideration. That is one great trouble with farmers, they do not agree on a system of doing things and then work together. One wants to do business one way and another another way, and it costs more to do it that way than if all were united. I think that ought to be settled among yourselves.

Referring to this question of what the creamery ought to do for the farmer, it has been suggested that the creamery is a good market for the farmer's product. Every creamery ought to be equipped so it can afford to pay the farmer as much as the market would pay for the same product, and if it does not then it is not being run successfully.

There is a great attempt by the centralizers to get the cream from the local creameries. I believe that ought to be discouraged. I believe the farmers ought to patronize the local creamery because if you ship

your cream to Chicago or Detroit, or some other place where there is a large centralizing plant, you are breaking up your local creamery. It would only take a few farmers to cripple the local creamery so it could not do business, because a creamery has to have a certain amount of business to pay expenses. When you cripple the creamery it has to go out of business, and when the centralizers put your local creamery out of business they will then pay you any price they desire for your cream. You are better off with the local creamery at your own door. I think the farmers ought to take that into consideration. I believe it is their duty as business men to patronize the local creamery, providing it is doing the fair thing. I do not advise anybody to patronize a creamery that they think is not doing a fair business. A creamery ought to treat every patron the same, ought to treat all the cream alike, ought to give everybody a square deal and if it did not I would see that it did. There is no use for a farmer to allow a creamery to beat him. The farmers have it all in their hands. Why not weigh your cream? Why not test it once in a while? Why not go to the creamery and see it tested? Why not take a sample and have it tested yourselves and see if it compares with the creamery test? This idea that a creamery has everything in its own hands is not so. You can know just exactly whether the creamery is giving you a square deal if you take a little trouble, that is all there is to it. Every little while I get an inquiry through the Michigan Farmer from some man asking if his test ought to vary, or if his creamery is giving him a square deal. These inquiries come from people who do not take any trouble. If you sold a lot of dressed hogs on the market would you weigh them before you went to the market? If you do not, do not say the fellow cheated you. The probability is that the hogs did not weigh quite so much as you thought they ought to weigh, and if you did not weigh them before you started you have no business to find fault with the price you receive.

I have had something to do with a creamery for the last seventeen or eighteen years. I not only patronize the creamery but I have some money invested in the creamery and I take lots of abuse from dissatisfied patrons, who say their tests are not right, the milk is not weighed correctly, and all that sort of thing. As far as that is concerned I do not know anything about it, but I suppose the milk is weighed correctly. I do not weigh or test the milk; the men are told to give a perfectly square deal and I expect they do. They make mistakes once in a while, but why doesn't the farmer know whether he is being cheated or not? If he has evidence he is being cheated there is only one thing to do. This variation of test gives dissatisfaction. Sometimes the cows are to blame, sometimes the creamery men are to blame, but more often it is because there is a real variation there, and if you ask a man what makes it he cannot tell you. We do not know what makes it, we do know that it varies, but the farmer is suspicious. We know the average farmer is like the Irishman, what he does not see he suspects. It is this suspicious spirit that causes a lot of trouble.

We perhaps have carried this subject on farther than we ought and we will not discuss it any longer. I want to call your attention to the evening program. Dr. Robinson, the state analyst, is here and will talk to us about tuberculosis. Then we are going to have this

subject "Should agriculture be taught in the district schools?" and Professor Shaw will tell us what the Agricultural College is doing for dairying. I hope you will all attend this evening.

We will now stand adjourned until 7:30 this evening.

---

### WEDNESDAY EVENING SESSION.

Meeting called to order at 8 o'clock by President Lillie, and opened with a vocal selection by the Ladies Quartette, of Tecumseh, consisting of Miss Edith Majors, Mrs. R. T. Mead, Miss Mary Kridler and Mrs. Ella M. Hodges. The selection was very much enjoyed by the dairymen and received unstinted applause.

The Chairman: Much interest is being taken at the present time in the question of tuberculosis. I believe that the present legislature will take some steps towards trying to eradicate this terrible scourage among the live stock interests of our state. It is a timely topic and I feel that we are very fortunate in having with us tonight our state analyst, Dr. F. W. Robinson, who will I am sure give us some up to date ideas on the question of tuberculosis, and also upon the idea of the state attempting to control it. I have great pleasure in introducing to you State Analyst Robinson.

### TUBERCULOSIS,—HOW SHOULD THE STATE ATTEMPT TO CONTROL?

DR. W. F. ROBINSON, STATE ANALYST, LANSING.

Mr. President, Ladies and Gentlemen:

In the last few years the people of the world have suddenly awakened to the idea that tuberculosis can be controlled in man and animals. Tuberculosis we possibly may be more familiar with under the name of consumption. The great white plague or the plague of the Caucasian race has been this scourage Tuberculosis, more commonly known until very recently as consumption.

I say the race has suddenly awakened in the last few years to the idea that tuberculosis can be controlled. The methods for the controlling of tuberculosis in man and in animals are vastly different than are the methods for the control of most other diseases. We have particular methods for the control of diphtheria and smallpox by means of vaccination. Those diseases are of such a nature, that is, smallpox and diphtheria are of such a nature, that there comes a period in their history when the disease reaches a climax and if the patient can successfully pass over that period recovery is possible. It has been impossible up to date to develop any critical period in tuberculosis or consump-

tion beyond which point if the patient survives he will live. The reason is that tuberculosis is a constantly progressive disease and so far as we know there is no product which is the outcome of the growth of the germs of tuberculosis which getting into the system acts itself directly as a poison to that germ, thereby causing the patient to recover.

Now let me make myself a little plainer. The theory of vaccination is simply this; we will take for example diphtheria or smallpox as a disease which is creating a certain condition in the patient's body, caused by the growth of tiny microscopic organisms called bacteria or germs. Now in the growth of these germs they excrete a product which in sufficient quantities is a poison to that germ. A little plainer explanation may be the comparison of the fermentation of sugar into alcohol. You remember when sugar ferments into alcohol there comes a point in this fermentation process where a certain amount of alcohol is developed, sufficient to free the activity of the yeast germ and no more alcohol is returned although there may be an abundance of sugar. In the same way the smallpox germ is introduced into the blood of the patient and will go on creating the products that it excretes because of its action. The excretion products will accumulate in the blood of that patient until the disease has increased sufficiently from that so there is enough of this excrement from the growth of that smallpox germ for further excrement to act as a poison to the germ itself and kill the germ, and the patient recovers. If a patient has sufficient vitality to live until that period is reached he will recover. If he has not sufficient vitality to stand the strain of the growth of that germ until it has enough poison to kill the germ, the patient dies. The theory of vaccination is this, that they will relatively produce the disease of smallpox in an animal, we will say a cow, and after this germ has grown its life out in the blood of the cow, the cow is killed and that excrement matter that has accumulated in the blood of the cow is directly injected into the blood of the patient when the first symptoms of smallpox have developed, so we relatively introduce into the patient's system the same conditions that would be there if the disease had progressed until enough of this matter had been accumulated to kill that germ, and this germ starting in the patient's system comes in contact with that excrement that kills the germ, and the patient recovers. That is the theory of vaccination and you can all understand that vaccination is one of the greatest blessings that has ever come to the human race. There is a great deal of prejudice against vaccination but that prejudice should not exist because it is simply the utilization of Nature's own method of curing the disease, but as is too frequently the case, the patient's vitality is all sapped up at the time Nature provides it, and he does not recover.

Diphtheria is the same way. We have introduced anti-toxin, but we have found no anti-toxin up to the present time for tuberculosis, because tuberculosis is a constantly progressing disease and the zenith of its progress is always the death of the patient.

Now, bearing that in mind with a slight modification that I will introduce directly, I repeat again that we have suddenly awakened to the fact that tuberculosis in man and animals can be cured and be cured by simple methods, the methods of elimination, and those methods have been proposed because of the discovery that one of the most de-

structive agents of a germ life is fresh air and sunshine, consequently the modern method of combating tuberculosis is a thorough aeration or airing of the patient's surroundings, both man and animal, and the introduction of as much light as can possibly be introduced into the living quarters of that person or animal. We will confine our discussion from now on to animals, particularly the dairy cows.

The particular reason why it is desirable to control tuberculosis in dairy cows is of course because one of our most important sources of food is the dairy cow,—milk, and without doubt much of the infection of the human race from tuberculosis is transmitted through the milk of the dairy cow. I venture to say that 6 per cent, possibly more, of all the dairy cows in the state of Michigan are affected with tuberculosis. I think that is easily a conservative statement. I have heard it stated that 10 per cent are so affected but I should say at least 6 per cent were affected with tuberculosis, over which we have at present no efficient supervision or control. We have no laws requiring the inspection and examination of animals for tuberculosis and no laws which will at the present time permit of the excluding of the milk of tuberculosis animals from human consumption, barring possibly a few regulations of Boards of Health in different cities; but the question is forcing itself upon our attention because we can no longer close our eyes to the fact that one of the most frequent sources of contamination to the human race is the dairy cow, milk consumed in its fresh raw state by children as well as by grown people, and there is an easy means of determining whether a cow is affected with tuberculosis or not. In the human patient this is through a microscopic examination of the sputum to determine whether or not the patient has tuberculosis. In the dairy cow we make use of a serum which is similar to the anti-toxin injected into the human patient in diphtheria, which serum life is not protective against the growth of tuberculosis but the injection of this serum into the animal's system does create certain pathogenic or pathological conditions which we can measure, viz., the introduction of this tuberculin, as it is called, this serum into the blood of the dairy cow, if the animal has tuberculosis will cause a decided rise in temperature within a certain length of time, and it is a common reaction that is used by veterinarians generally through the United States at the present time. Parke, Davis & Co., and other large druggists keep this product in stock.

Now there is little necessity of studying the phase of the tuberculosis problem which questions the transmissibility of tuberculosis from animals to man. It has been definitely proved that tuberculosis of man can be transmitted to the lower animals and in a form which cannot be recognized from the ordinary tuberculosis that those animals have, consequently we feel safe in assuming that tuberculosis from animals can be directly transmitted to man and is directly transmitted to man. In fact there are numerous instances in which the elimination of other points would clearly justify us in saying that tuberculosis is transmitted from animals to man, and with six per cent of the cows that are furnishing milk to the cities and villages for human consumption, affected with tuberculosis, it seems imperative that the state and the government should take some urgent measures for the eradication of this disease.

What measures may be taken? The measures that occur to me now,

some of them, as being most satisfactory and as causing the conditions to change as rapidly as possible, will be a more thorough inspection of the conditions under which the dairy cows now live in the state. The Dairy and Food Department is attempting at the present time as thorough and systematic investigation of farm dairies as can possibly be made, but the funds at the disposal of that department are insufficient to meet this problem. I intended or hoped to bring down some slides to throw on the lantern here tonight that would show you some conditions favoring the development of tuberculosis and conditions which are favorable to its eradication, but I could not get them ready in time so I will describe some of them.

The first requirement of course will be a stable which meets the conditions which are unfavorable to the development of tuberculosis. That will of course mean a stable which is liberally supplied with air, in which the air is frequently changed and can be frequently changed; and in which there is plenty of light, and not an excessive accumulation of straw, hay and litter; a stable that can be easily cleaned and is frequently cleaned; that is high and dry, well ventilated and well lighted. Those are the conditions under which a dairy cow must exist in order to be free from tuberculosis. An inspector of the state should be empowered to go from farm to farm and see that the conditions are such that tuberculosis is not grown and developed from day to day in that herd.

Second, there should be some system of inspection by means of which cows that are afflicted with tuberculosis may be removed from supplying milk for human consumption. Right along this point is where the problem reaches its height. There is no dairyman who is anxious to sell milk for human consumption which itself may transmit tuberculosis. That goes without saying, no more than there is any manufacturer of food products who is anxious to sell on the market food products that are injurious to health. There is no such person, but a dairyman naturally looks with suspicion upon any system which goes into his barn and condemns and ruthlessly destroys a portion of his herd without some compensation reverting to him. We have read recently much concerning the dreaded mouth and hoof disease in our state and measures that were taken to eradicate that disease. The arrangements by which a farmer is paid are that the national government shall refund for the animal condemned and destroyed two thirds of the value of that animal, and the state one third of the value of the animal, thereby reimbursing the farmer for the loss of the condemned animal.

It seems to me that when we have no compulsory system of inspection the dairyman is not going to welcome and request an inspection of his herd for tuberculosis in order to weed out the animals that are affected with tuberculosis, when the only outcome he can see to that is possibly two or three or a half dozen or more of his herd will be destroyed and there will be no financial compensation to him from that procedure. We might insist in the villages and in the cities that the milk man who delivers us milk shall exhibit to us a statement that all of the cows that he keeps have been tuberculin tested and found free from tuberculosis, but there is not a sufficient amount of milk supplied so that we can demand that of the milkman, and he has such a large market for his product that he can say that unless he can have suffi-

cient remuneration for losses incurred he will not go to that expense and will prefer to supply the milk to another market rather than go to that trouble, take it to a cheese factory, or a creamery or possibly to another milk route. But if the state will insist upon and provide for a systematic inspection providing for the tuberculin test, have some system by means of which those cows which react may be culled out and destroyed, slaughtered, and if the disease is localized those portions which are not affected permitted to be put on the market under a certain label, and then renumerate every man for the loss of his animals, I think the farmers and dairymen will welcome the tuberculin test, will welcome the inspector who comes to inspect his herd, and in that way we can eradicate tuberculosis from the state. I do not think any legislature can provide any effective legislation which will eradicate the disease which falls short of that, and I believe with proper support from the people of the state that the legislature will in some way meet those requirements.

Tuberculosis can be cured and it is cured, first by preventive measures and second by eradication, isolation, both methods being controlled by a systematic state inspection which carries with it authority to renumerate for animals condemned. The subject is sufficiently fresh in the minds of most of us so that I think there is no further discussion necessary on this point.

The Chairman: I understand the next speaker would like to finish in time so as to take a train, so we will omit any discussion on the subject of tuberculosis, which I would like to hear, until after the next topic. The next subject is "Should Agriculture be taught in the Rural Schools?" It is certainly a very important and interesting topic and is a matter that I believe is going to have great influence upon the farming industry in the years to come. You are very much better acquainted with the next speaker than I am. I am glad, however, to say that I am pleased to introduce your county commissioner of schools, Mr. Hensel, a man who is a good enough educator and good enough politician to hold that office for twelve years.

## SHOULD AGRICULTURE BE TAUGHT IN THE RURAL SCHOOLS?

M. W. HENSEL, SUPT. OF COUNTY SCHOOLS.

Mr. Chairman, Ladies and Gentlemen:

I do not know that I can say much to you tonight on this question but what I am sure is such as you will agree with me, such as you believe yourselves. I was brought up on a farm and I was brought up in a place where at that time there was very little if any scientific farming and I was led to believe that about all there was to farm work was simply to pick stones and pile them up, cut briars and pile them up and burn them up, hoe the corn, and work of that kind. Well I think



there is a higher value to be placed on farm life than that and as a sort of introduction I will read a little article I clipped today, which is as follows:

"The total value of farm products this last year amounted to \$7,778,000,000, four per cent more than the value of the product of 1907 and four times as large as the value of our mining products. By farm products we mean farm and animals products. Corn represents one third of the total, cotton, hay and wheat one third and all the rest the other third, but corn leads this year in value of total crops. Eggs and poultry are more valuable than the whole cotton crop. Three eighths of the value of farm products are represented by animals sold and slaughtered and by animal products at the farm."

Now, my friends, when we see that the value of farm products is as great as this in one year, more than four times that of the great mines of this country, I think you will agree with me that it holds such an important place in the industries of the world that there should be special instructions given in that subject.

There are many reasons in my mind why there should be instructions given in Agriculture in the rural schools and I cannot find a single good reason why there should not be such instruction given. In the first place, years ago, when the country was new, when the soil was virgin, it was not a difficult matter to raise a good crop when one's land was cleared; but since the soil has been worked and tilled repeatedly it necessarily loses some of its fertility and as years go by, unless this soil is taken care of properly, it will keep losing its fertility and as the world grows in population we must necessarily have a greater amount of farm products in order that this increased population may live.

The rules of supply and demand govern prices. If we do not have such education as will teach the people who are going to run the farms of the future to intensify farming, to preserve the fertility of the soil, the time will come in the history of the world when it will be impossible to supply the food products for the world; but I believe that time will never come for the reason that the people are awakening to the benefits of careful, scientific farming.

Now there have been complaints many times and at many places on the part of the farmers that the boys and girls are leaving the farm. I believe that one reason for this is the fact that there has been so much humdrum work on the farm and the boys and girls on the farm have not been willing to see that farming comprises not one science but many sciences, and now if there were some instruction given, even though it is but elementary, many experiments may be given in the rural schools for little expense and at the loss of but little time; if the boys and girls of the farm, as I say, are shown the possibility that there is on the farm, the many different lines of scientific investigation that they may follow out. Why, there are wonderful things that they may discover there if they will only have a little direction in making these investigations; if they are lead, as I say, to do those things, then there is no doubt but the boys and girls will see they have a vocation or profession that is equal to any in the world and the humdrum of farm life will be done away with in a large measure.

Now, as I said before, I can see many reasons why there should be agricultural training in the rural schools and no reason why there should not be. Perhaps the principal reason why we have not more of this training is the fact that it is only within the last few years that the farming communities of this country have awakened to the fact that their work is of a scientific character. We would find here and there perhaps a man who had attended some agricultural college, not only in this state but in other states the same is true, and who realized that farming is a science, but the great mass of people did not realize that until within the last ten or fifteen years and gradually they are awakening to that fact, gradually they are determining that there be some instruction given in the public schools along this line. I have heard people say "Why don't you put in instruction in carpentry and other lines?" We do, in cities especially we have our manual training schools where carpentry is taught and all the trades, yet none of them feed the world by any means. Without the farmer, without agriculture pursuits it will be impossible for the people of the world to live and, as I said a while ago, unless the supply of farm products keeps pace with the increasing population there will be a time when the cost of living will be too great for people, especially in the cities, to bear.

I do not know of any more reasons that I need to give you tonight but I will say this, that on the other hand the obstacles in the way of future teaching of agriculture in the rural schools, in my judgment, are two. First of all, we have not trained teachers for the work and one can teach no subject unless they know something about that subject. Every person who attempts to teach any subject ought to know a great deal more about the subject than they attempt to teach. There is always considerable knowledge lost in transmission from man to man and the teacher should know so much more than he should ever attempt to teach, because he can see the relation of the subject to other matters and thus make the matter clear to the pupil. The trouble has been that we have not had teachers properly trained to teach this particular subject, but teachers too are awakening to the value of this work, and as a member of the State Teachers' Reading Circle Board, which selects the books for the teachers' reading course of this state, I helped to select for this year's course in reading a little work on agriculture, "Hatch and Hazlewood's Agriculture." In this state there are perhaps six thousand teachers reading that book this year through the reading circle, and in this county I have advised the teachers in many instances to form some classes and perform some experiments out of that book. A number of the teachers are using that book in regular class room work this year. While the work is very elementary, it is in my judgment a very practical work; in some cases where they are not using the book as a regular class room book, they are reading from this book to their pupils and are asking their pupils their opinions about this thing and that thing that is mentioned in the book. I believe that sort of work is going to help to arouse the interest of the people in the science of agriculture and its teaching in the rural schools.

Two things that are going to remedy the lack of a sufficient number of properly trained teachers are the special courses given by the agricultural college towards fitting teachers for this work and the county normal training schools. The county normal schools of this state, of

which there are something more than forty, have a course in elementary agriculture, and these teachers who go out from the country normals know something about what should be done in this particular work and some of them are putting it into practice. Those two factors, the summer courses and special courses at the agricultural college, fit teachers for agricultural teaching and the County Normal training schools are going to do a great deal towards overcoming this trouble of the past in this respect.

Then another difficulty that we have to contend with in teaching agriculture in the rural schools is the crowded curriculum in a fairly large district school. Now the course of study is of course quite complete and quite full, and if you take a school of thirty or thirty-five pupils and eight grades of work, it is pretty hard for the teacher to get much opportunity to add another study. However, I think it is of enough importance to at least put it in with some such study as physiology, civil government, and by a series of experiments enough interest can be aroused to make up for any losses of time that they may have on any particular text book.

The time will come, I hope, when we will have a system of grade schools, I mean grade in the sense of two rooms or more by consolidation or otherwise in the rural schools. If we have the proper grades of our pupils there, there is no question but then we will get quite an extensive course in agriculture, which is a very important subject, the most important thing for the world to know not only for the farmer but for the world at large to know, I think, is that it demands a place in the curriculum not only of the rural schools but of the village and city high schools. Someone will say the city boy or girl does not want any agriculture, but the village and smaller cities certainly do, and I believe if agriculture were properly taught in the large cities in the high schools it would be the means of opening up new views to those boys and girls in the cities and they would be more likely to try and get out in the country and make a living there in the pure air, whereas now they are crowded in the slums. I really believe it would be the means of helping the world to a better system of morals as well as helping them in their financial and physical condition.

I believe I have about covered all the elementary points that are necessary to cover. I did not intend to talk very long and those are my views on the subject and I trust that they are sufficient to lead you, if you have not already thought about the importance of this subject, to think more seriously about it.

#### DISCUSSION.

The Chairman: For my part, I am very glad indeed to have the speaker take that side of the question. I have always believed that we ought to have elementary agriculture in our district schools. The boys and girls growing up on the farm ought to know something about the things on the farm, plant life and animal life, and I believe it cannot but be helpful to the future generation of country people if agriculture is taught in the public schools.

Now both these subjects are open for discussion and we will be very glad to have anyone criticise the stand taken by either speaker upon

his respective topic. That is what we are here for. The speakers simply introduce the subject and we would like to have them discussed. Are there any questions you would like to ask?

Mr. Hall: I would like to ask Dr. Robinson if it is not a fact that the tuberculin test is far from infallible?

Dr. Robinson: That is a question that might be expected. I think that it is possible for a cow to have tuberculosis and not respond to the tuberculin test. I do not believe a cow that responds to the tuberculin test will not have tuberculosis. I think that is pretty safe.

Mr Hall: Is it not a fact that cows have reacted to the tuberculin test, have had a rising temperature, which is an indication that is depended upon almost entirely for the reaction, is it not a fact that cows that have reacted have been killed and found to be absolutely free from any sign of tuberculosis?

Dr. Robinson: Yes I think that is true. I would not however modify the statement I made in that respect, except to say that other conditions must be very carefully and religiously eliminated, such conditions as the physical conditions of the cow at the time the test is made and her nervous condition at that particular time. If those conditions are normal the cow will not react to the tuberculin test if she has not tuberculosis. If, however, there are any clinical symptoms otherwise of tuberculosis except the tuberculin reaction, the cow should not be killed on that one test but she should be isolated immediately and a little later the test should be applied a second time to confirm the original diagnosis, which is not to confirm the activity of the tuberculin reaction but simply to confirm the judgment of the operator in selecting the proper period for applying the tuberculin test.

Mr. Hall: I would like to ask another question. Is it necessary that a valuable cow reacting to the tuberculin test should be killed?

Dr. Robinson: Not absolutely necessary. The animal may have localized the tuberculosis for example, and it is extremely improbable to my mind that that animal will transmit tuberculosis through the milk except there be an incipient tubercular infection of the udder. However, the milk from the animal which reacts to the tuberculin test should never be sold on the market as pure milk, without the consumer being warned of the fact that the animal reacted to that test.

The Chairman: If that milk were pasteurized would it not be all right?

Dr. Robinson: Yes, Sir, if the milk were pasteurized at a sufficiently high temperature the germs would all be destroyed.

The Chairman: Much of the milk consumed in Detroit is pasteurized before it is put on the market, is it not?

Dr. Robinson: Yes, Sir.

The Chairman: If a man has his herd tested and a large number of the cows react, if those animals are isolated and kept in a place adapted for overcoming the effects of tuberculosis, might it not be possible for them to recover and progeny from those cows be raised? The calves should be isolated and reared without any danger of their having tuberculosis.

Dr. Robinson: I think they might, yes, sir.

Mr. Hall: That is the point I wished to bring out, not that the milk from the valuable cow should be put on the market, but if you have a

valuable cow naturally you would like to save her calves. As I understand the matter, it is not necessary that such a cow should produce a tubercular calf. If when the calf is born it is taken away from the cow, is never given that cow's or any other tubercular cow's milk, we will have as healthy a calf as one raised from a purely healthy cow, and I believe that it would be better for the world in general and for the dairy products in particular to have that cow saved and used to breed good healthy dairy stock that would yield a profit in their production.

The Chairman: What would you do with the milk from that cow?

Mr. Hall: According to the doctor, we can pasteurize that milk and sell it? A few days ago I saw in the paper that the owner of Colantha's Fourth Johanna was offered \$5,000 for her unborn male calf as soon as born alive. We could not afford to destroy such a cow. Her progeny is worth many times what her milk would be.

The Chairman: If she gave 20,000 pounds of milk a year we could not afford to throw that away.

Dr. Robinson: There is this one thing about the milk end of that proposition. Of course in discussing tuberculosis in a dairy cow I was discussing it particularly from the milk standpoint, but the progeny of that animal should be examined carefully and their careers followed carefully because of the possible predisposition of that animal to the disease from which the mother suffered.

The Chairman: Do I understand that you think tuberculosis is hereditary?

Dr. Robinson: No sir, I said the predisposition to tuberculosis. That is, the mother having tuberculosis, handed a special weakness to the offspring in that respect; but the other question, about the use of the milk under any condition, I can scarcely help returning to the subject in the form of a question and ask if you would be willing, knowing that the animal has tuberculosis, to drink the milk from that animal under any condition?

Mr. Hall: I certainly would not knowingly.

Dr. Robinson: If that is true, we certainly should demand when a man sells that milk that it should be plainly labeled to the consumer so that he may exercise that same choice.

Mr. Hall: I would not indicate for one minute that that milk should be put on the market. But another question has been suggested to me along this line. What effect would such milk have if sold to a cheese factory? Would the heating there destroy the germs?

Dr. Robinson: All the records we have at present show that for a short period of time a temperature of 160 degrees F. is destructive of the germ. It is quite easily killed and so far as we know the tuberculous bacilli is not a spore bearing germ, by means of which we need to reheat the milk a second day to kill the spores. I am not sufficiently familiar with the methods in the cheese factory to answer that question about the temperature. My understanding is that it is not pasteurized and certainly milk should be pasteurized that comes from such an animal before it is used, then I think it can be used in the production of cheese or butter.

Member: I would like to ask why tuberculosis is so much more

prevalent at the present time than if formerly was, and what is the reason of it?

Dr. Robinson: I think it is not. In fact I think it is less prevalent at the present time than it was ten years ago.

Member: What I had reference to was the whole of the cattle in the west.

Dr. Robinson: We have discovered the cause of one of our great scourges and it is possible, and in fact no doubt true, that this disease has been among us ever since we have housed cattle under the conditions we do at the present time, without our being able to recognize it. We frequently hear that other argument in other lines of medicine, for example, that we never heard of appendicitis until the last few years. The facts of the case are that we have had inflammation of the bowels for years and years and have never recognized exactly its particular form, but now, because we have been able by advanced study in those lines, to recognize and differentiate those diseases, specific attention has been riveted on these one or two more important ones and that is the reason they have been brought into greater prominence, I think. That is my idea.

Mr. Hall: I have seen the statement somewhere that in some state in this country one third of the dairy cows are afflicted with tuberculosis and I notice that the reputable dealers in advertising their cattle always say "Tuberculin tested." I do not believe the statement that one third of the dairy cows in one state of the union are afflicted with tuberculosis. It would seem, if that were true however, a terrible thing to have to slaughter them and I wondered if there was any way to make those animals productive without endangering the lives of human beings or inoculating other cows. I know that people generally do not recognize the fact that tuberculosis exists among their cows, perhaps even in our own vicinity here, but in my experience among cattle I am positive that I have known quite a number of cows that have died of tuberculosis and their owners never knew they had them, and there must have been more or less infection from those cows.

Dr. Robinson: The great problem with the toleration of this disease is that it is difficult under any system of toleration to eradicate the disease, but if the state is empowered, with systematic quarantine regulations for example, whereby it would not be possible to ship tubercular animals from one state to another or from one section of the country to another, or any stock used for breeding purposes, if every state could insist before the animals be used for breeding purposes that they be examined and found free from tuberculosis, all those things would hasten the time when ultimately there would be no tuberculosis because it is possible to eradicate the disease if sufficiently strenuous measures are used.

Lady: I would like to ask Mr. Hensel for how many years they have held the summer normals?

Mr. Hensel: Recently. The state superintendent has full control of the summer normals and those have been conducted in connection with the summer school of the state normals. Perhaps you did not understand me when I spoke of the county normals and the special courses at the agricultural college, if that is what you have reference to. You undoubtedly know of the county normal training classes which we have.

This holds through the school year, nine or ten months. Some places for six weeks and in some places as many as forty weeks. The Agricultural College did have last year, for the first time, a special six weeks course along with the rest of the summer school, to fit teachers to teach agriculture in the rural schools, or in the small village high schools.

Lady: I was considering it from the standpoint of the teacher. She has her school year's work, her summer school and her reading circle. How many years do you think a teacher can keep up that sort of work?

Mr. Hensel: It is not necessary for any teacher to do all that sort of work.

Lady: Most of our teachers are graduates from the high schools of the state. The result upon the children I think is not always what we most desire. Do you find it so?

Mr. Hensel: It is true that while their education from the standpoint of scholarship is good enough, they do not know how to present their subject. If I had my way no teacher would be allowed to go into a school room without training. Now do not understand me to say that a person cannot be a good teacher without training because she can be if she has natural ability along that line, but the training would make her a better teacher.

Mrs. Hall: Is there a surplus of desirable teachers in this county?

Mr. Hensel: There is not, of desirable teachers.

Mr. Bramble: Then the question arises, would there not be a greater dearth if we added agriculture to the curriculum for the teachers?

Mr. Hensel: Yes there would probably be. This is the first time in several years that we have had more teachers that held certificates and wanted schools than we have schools to give them.

Mr. Bramble: It seems to me the theory of teaching agriculture in the schools is one that appeals to everyone, but the practical application is a very difficult problem. It seems to me that the boys and girls on the farm have a very good elementary education along agricultural lines right at home, if the parents do their duty.

The Chairman: Yes, if the parents do their duty.

Mr. Bramble: The point I wanted to bring out was this. The curriculum of our district schools is very full: There is a dearth of desirable teachers today. If it were possible to get desirable teachers and knew it was practical to teach with those other topics elementary agriculture, it would be a good thing but to compel people to teach it now or in the next five years, it would make a great many very ridiculous to try to teach those things about which they knew nothing. I believe it would be a very good thing if we had established teachers in our high schools and a department of agriculture along with the manual training schools. Out of that we could develop a great many good teachers but until we could do that and put in a course of elementary agriculture along with the manual training schools in our high schools, it seems to me it would be unwise to start in our district schools to teach agriculture without a preparation of the teachers in the high schools. Go into the high schools and teach agriculture first and give the teachers a good education there before you try to put it into the district schools.

Mr. Hensel: Mr. Bramble, have you ever seen one of those elementary

works in agriculture? If you have you would be very easily convinced that it is a very practical book, and any teacher with average common sense, and I believe they nearly all have that, especially if they have had training in botany, will soon be able to pick up that book and perform experiments given there and figure out the problems that are there; and while I agree with you that I would not force the teachers to teach that within the next five years, we can by careful approach to it within the next few years compel teachers to fit themselves to teach it. In the condition of the rural schools at the present time I would not force that on the teachers. I agree also that there should be a course in the high school, that it would be a good thing, but still I insist that the teacher who has had high school training if she wishes to do this work can take up an elementary work like Hatch & Hazlewood's and do a great deal of good to the subject.

The Chairman: Is there any further discussion? If not, I am sorry to announce that Professor Shaw was not able to get here this evening but he will be here to discuss his topic tomorrow afternoon. He was detained on account of the meeting of the Association of the improved Live Stock Breeders at the College and could not be here this evening. That is one reason why we can allow this discussion to run along. I am sure it has been very interesting and also very profitable. Are there any other questions or do you care to continue this discussion?

Member: Mr. Chairman, I was very much interested in this address on tuberculosis and that is one reason why I stayed tonight, to know more about it. I have a herd of ten dairy cows. I know this is a problem that we as farmers and dairymen have to face, it is upon us now and I have come here to learn. I would like to know if there is any way of knowing whether a cow is affected with tuberculosis without the tuberculin test, and is it true that the most dangerous symptom of this tuberculosis is when it attacks the cow's udder? That is what I have been told.

Dr. Robinson: So far as its transmission through the milk, that is true when they have tuberculosis of the udder, it is a most dangerous condition. I do not imagine for a person that is at all untrained in veterinary science that it is easy for him to detect a cow afflicted with the disease unless she be in a well advanced stage of the disease. When she is in that condition, through the general condition, the emaciation, very frequently some information can be gained by a person that is at all familiar with an animal by pressing down the throat of an animal whereby you will get that peculiar coughing sensation that even an animal exhibits in the presence of tuberculosis; but the safest way with a valuable herd for your own protection, to say nothing of the danger of infecting the human race through the milk, is to have from time to time, possibly once in a year or such a matter, the whole herd subjected to the tuberculin test so you may catch the disease in the early stage and isolate any affected animals before they communicate the contagion to the remainder of the herd. After seeing it operated once by a competent veterinary a man could probably operate himself next time.

Member: Is it necessary to have an expert use this tuberculin test, or can any ordinary veterinary do this work?



Dr. Robinson: Any competent veterinary can do the work.

Member: Another question I would like to ask. Is any part of the meat of a cow affected by tuberculosis fit to eat?

Dr. Robinson: That depends on the post mortem examination. If it shows it is entirely localized, by which the tubercles occupy the alimentary tract almost completely, as is usually the case, the meat of the animal may be safely sold for food consumption. If the disease is well advanced, by means of which different portions of the fat and other portions of the carcass show little lumps or tubercles, then of course it should by all means be condemned. But if it is localized, as is generally the case, except the animal has tuberculosis of the udder, then it can be used for food purposes.

Member: Is it a fact that the lungs are more apt to be affected than any other part of the body?

Dr. Robinson: No, not necessarily. The lungs are affected in advanced stages, and the linings of the throat and the larger intestines.

Member: How can one know the advanced stages?

Dr. Robinson: The emaciated condition of the animal. Tuberculosis is not difficult to detect under post mortem examination because it exhibits itself in little tubercles or lumps. It looks like the sprouts that come on potatoes in a dark cellar. It exhibits itself along the linings of the digestive canal and on the edges of the organs, but unless the animal has a severe form of tuberculosis it is not apt to filter through and get into the meat itself, which is used for food.

Mr. Hall: Does it necessarily follow that an animal in an advanced stage of tuberculosis has to be in a thin condition? Is it not a fact that animals frequently appear to be in perfect condition and yet are quite seriously affected?

Dr. Robinson: There are many instances as you state, but the ordinary condition of an animal affected with tuberculosis in an advanced stage is what gave rise to the old synonym for tuberculosis, viz., consumption, a consuming of the flesh of the animal, and that is the ordinary condition in an advanced stage, but what you say is true in a good many instances.

The Chairman: I would like to ask Dr. Robinson if he thinks an animal that has been housed all winter and in the spring responded to the tuberculin test could by running out doors all summer, but without receiving any further treatment, be cured of tuberculosis so as not to respond to the test again?

Dr. Robinson: I think so, yes sir.

The Chairman: Then the question of ventilation is a very important one in treating this disease. There is not much use in having our herds inspected and tested for tuberculosis, in culling out those that respond and putting back those that do not respond in the same stable. You will have to repeat the process the next year. I tell you this disease in animals is a barn disease and tuberculosis in human beings is a house disease. You want to ventilate your barns, that does not mean having cracks so the snow blows in, but there should be some system of ventilation so the animals breathe good pure air, then feed them properly and take good care of them and if they accidentally become affected with this disease in many instances they will recover without our knowing

it. It is absolute nonsense to kill off the affected animals and put back in the same barn the cows that are not then affected with the disease.

Member: Cannot cows be kept in the barn all winter and still be healthy?

The Chairman: Certainly. All we have to do is to have well ventilated barns, well lighted, and they will come through the winter in good shape.

Member: Cannot we have fresh air and still have warm air? Is it necessary to sleep in a cold room and have fresh air to be healthy?

The Chairman: No, you can ventilate the house the same as you do a barn. You can save the warm air near the ceiling and let the impure air out. You can have good ventilation in any house if you only have an opening because you can put in a little more fuel and you will heat the air, and open the window to get circulation. That is all there is to ventilation is simply a change of air; but in a cow stable you have not artificial heat, and there it is necessary if you keep the temperature of the stable as you ought to, to save the warm air near the ceiling, and you do that by introducing cold air down below and it runs out up above. Then you build a chimney and have it open next the floor, having it run all through the storage part of the barn, up through the roof. The pure air comes in through the chimney, gradually mixes through the warm air, that forces a circulation, and the most impure air moves over to your ventilating shaft and off out doors, and you save the warm air. You can do that in the house but it is not so necessary because all you have to do is to open a window and put on another stick of wood.

If there is nothing further, perhaps we had better close. You will notice the first on the program this evening was a question box. We did not expect there would be any questions for that, and we have arranged to take that question box up tomorrow afternoon, right after dinner. I would like to have you come prepared with any questions you would like to have answered here.

If there is nothing further to come before the association this evening, we will now stand adjourned until 10 o'clock tomorrow morning.

## THURSDAY MORNING SESSION.

Meeting called to order at 10 o'clock by President Lillie, and opened with a piano solo by Mrs. Ella M. Hodges.

The Chairman: There is a slight transposition of the program this morning. Mr. Palmer could not be here to present his paper so Mr. Mills has consented to read his paper this morning. We will now listen to Mr. Mill's paper on Alfalfa.

## ALFALFA.

MR. A. W. MILLS, TECUMSEH.

Mr. Chairman, Ladies and Gentlemen:

Alfalfa is a native of Europe, where it has been cultivated for ages.

One authority says, "Alfalfa does well in frozen Sweden, in ice covered Norway, it flourishes in many parts of Canada, and is at home in Montana or Maine."

In the western part of our country for many years it has been their main dependence both for pasture and hay for all kinds of farm stock. Today it is being raised and we are told if properly seeded and cared for, is a success in every state of our republic. It seems to be proven that some of our soil is not already provided with the necessary bacteria to assure its immediate success and such land must be inoculated either by dirt from points already provided with the little microbes or the seed must be treated by a culture that will bring about the same results. In many places the land is already provided the necessary inoculation. Make a rich deep well worked seed bed and take the best of care of the young tender plant and you will be well paid for your extra trouble and expense.

Prof. Moore, of Wisconsin Agriculture College said, "Alfalfa Hay, if properly cured is equal pound for pound to the best wheat bran in feeding value."

Gov. Hoard of Wisconsin grew 180 tons on 35 acres and he asserts that every ton was worth from three to four tons of the best timothy, that it can be grown on any soil, and is hardier than red clover.

Our esteemed neighbor on the north, Mr. John T. Clark, was, I believe, the first to introduce the plant in this locality. He has been growing it successfully for twenty years and now many of his neighbors, like himself, have large tracts of it, and every year their barns are filled with its choice hay. Mr. Clark, said to me, "I would rather have one ton of Alfalfa Hay than have a ton and a half of any other hay I ever raised."

This last summer Mr. J. R. Keeney secured over 120 large bulky

loads from 24 acres; as alfalfa hay is very heavy it is safe to say that he got about five tons to the acre, from roots only two years old. Mr. Keeney is a feeder of lambs and his comment on alfalfa hay was, "It is corn and hay in itself."

As nearly as I can estimate not less than 500 acres of Alfalfa are growing in this vicinity and a large acreage will be seeded this coming spring and summer.

It is a wonderful forage, fertilizer, and hay plant; after once established it is almost drouth proof. The roots run so deep that drouth has but little effect upon it. Last summer when I cut my third crop of hay about the 20th of August the ground was dry and from that time till about the first of October no rain fell and still when I cut my fourth crop during the first week, or only three or four days after that rain the alfalfa averaged very close if not quite two feet high. This shows how little effect the drouth had on its growth and this alfalfa was only one year old.

It is recorded that Alfalfa has been known to send its roots over sixty feet into the ground.

The prime condition of growing this plant, is the ground must be well drained either naturally or artificially. It will not stand wet feet. It will grow on any soil that will successfully grow wheat, oats, or red clover. If seed is good and ground rich it is a great producer. It is said that 300 stalks have grown from one seed.

The plant does not exhaust the soil, but enriches it. The leaves draw from the air large quantities of nitrogen and stores it in the ground and you can find it in little black balls or nodules on the roots. The roots penetrating the earth to such depth bring to the surface much inorganic and mineral substance of material value. Then the large and numerous roots of the plant add much humus to the soil.

Protein is the most important part of feed that the farmer produces and it gives to Alfalfa its great feeding value. The per cent of protein in some of the most common farm feed as given by government analysis are as follows: Corn in bundle, 4.5; barley unthreshed, 9.3; oats in bundle, 7.4; cornstalks, 1.9; wheat straw, 3.4; rye straw, 3; oat straw, 4. Of the roots: Potatoes, 2.1; sugar beets, 1.5; mangle wurtzels, 1.4; turnips, 1.3. Grain: Shelled corn, 10.3; barley, 12.4; oats, 11.8; rye, 10.6; wheat, 11.8; buckwheat 10; sugar beet pulp, fresh, 1; dry, 10.8; timothy hay, 3.6; red clover hay, 12.3; alfalfa hay, 14.3.

When you consider that where you can raise two tons of red clover hay, you can raise from four to six tons of alfalfa and that each ton of alfalfa is worth as much as a ton of wheat bran for which you pay \$25, you begin to realize what a gold mine you may have right on your own farm. Won't it pay to locate it there?

My judgement is, that the best way to secure a seeding in this locality is to select a well drained piece of rich land, manure it well as though you were determined to raise a big crop of wheat, plow it in the fall, in the spring go on it with your disc and work it up deep and thoroughly, then every week or so go over it with a spring tooth harrow. This works it down into a solid deep seed bed and kills the weeds that are starting. From the first to the middle of June smooth it down with drag and roller so that seed will not be covered too deep, then sow

from 15 to 20 pounds of the best and purest northern grown seed you can get, grown in Wisconsin or Montana. Go over it twice with wheelbarrow seeder in opposite directions and follow with a light drag or weeder and cross drag with the same. Clip the crop once or twice during the season to keep the weeds back and give the young plant a good chance. Leave the clippings on the ground.

Some have good success by sowing the seed in the spring with oats or barley, using only a bushel of grain to the acre.

I have seen a number of good seedings where sown among corn at last cultivating, but the season must be a very favorable one to succeed in this way.

About six weeks before you wish to seed, send to Department of Agriculture, Washington, D. C., telling them when you wish to seed, the amount of seed, and the number of acres, and ask for culture with which to inoculate your alfalfa seed. Possibly your ground may not need it but it will do no harm and the government furnishes it free of charge.

Also, some weeks before you are ready to seed send sample of seed to Prof. Beal, of Michigan Agricultural College, and he will tell you if seed is pure.

Between June 30th and December 30th, 1907, there were imported into this country by unscrupulous dealers 110,760 pounds of Yellow Tufoil and a very large amount of Dadder seed; the government agent says that nearly all of it was used to adulterate alfalfa and red clover. They are both very bad seeds. Dadder is the worst enemy to alfalfa known.

Here is the temptation to the dishonest dealer:

One hundred pounds of this worse than worthless seed costs him \$2.00.

One hundred pounds good alfalfa seed worth \$20.00.

Cost of 200 pounds mixture, \$22.00.

He sells 200 pounds of mixture, 20 cents per pound, \$40.00.

Dealers profit, \$18.00.

Farmer pays for 200 pounds mixture, \$40.00.

One hundred pounds good seed bought worth \$20.00.

Farmer pays for 100 pounds very bad weed seed, \$20.00.

It is said that none but experts can detect the presence of this weed seed.

I presume most of you dairymen have a silo, if not I surely would have one, for it must add greatly to the dairymans' profit.

I am told that if weather is rainy or catchy when alfalfa is ready to cut some of our best farmers cut and immediately put the alfalfa in silo. It is a quick way to do the haying without regard to the weather.

I imagine you all have our luscious Michigan Yellow Peaches. How we do enjoy them as we pick them from the tree. They almost melt in our mouths, and when in mid-winter when fruit is scarce, our good house-wife opens a can and presents us with the same taste retained as when we picked them last summer, we say, "Food Fit for a King."

If there is one grass for which cows will go the farthest or try the hardest to get at, and when they do get it will eat ravenously, it is alfalfa, and when in mid-winter when everything outside is frozen

and every feed is dry, if these cows can each day have a mess of this choicest food on the farm and have it almost in the same condition as when growing in the pasture, do you wonder that they laugh at these peaches and cream? And is it strange that they give a larger quantity of a better quality of milk? They could'nt help it if they tried.

#### DISCUSSION.

The Chairman: I am sure this has been a very interesting paper. We would like to have questions asked Mr. Mills. As no one was placed on the program to lead in the discussion, it is open for general discussion. Has anyone anything to say about alfalfa? I am very glad to know there is such alfalfa grown in this vicinity. Five hundred acres, you say Mr. Mills? I would like to know, Mr. Mills, if the people who are growing alfalfa are discarding red clover?

Mr. Mills: I think not.

The Chairman: They are growing red clover just the same? In your opinion alfalfa would not be as good to work into a rotation of crops on the farm as red clover?

Mr. Miles: I think not from the fact that those who have had experience say it will last ten years, so that would not do for rotation.

The Chairman: Then if by introducing alfalfa it would crowd out red clover from the rotation, the balance of the farm would not be benefited by growing red clover. What would you do with all your hay? You raise so much alfalfa, four to five tons to the acre, if you raise clover in rotation on the balance of your farm it seems to me there would be a surplus of this kind of roughage.

Mr. Miles: Plow it under.

Member: Buy more cows and feed more hay.

The Chairman: You can buy more cows but that takes more of other kinds of feed too, so you would have to buy other kinds of feed. Mr. Mills, do you think alfalfa makes a practical cow pasture?

Mr. Mills: I am not sure in this locality in regard to that question. In the West they depend upon it almost entirely for pasture but the general impression here is that it injures the clover in this latitude to have it tramped down by the cows. I believe there is one exception to that here. Mr. Andrew Wilson, on the edge of town, has ten acres and he told me that through mistake last fall his sheep got on to his alfalfa meadow and ate it down very closely. He feared very much that it was ruined but he said last Spring it came on as well as ever and he had good crops this year, so possibly it is not injured as much as it might appear. It is such a precious plant that people are very careful of it in this country.

The Chairman: Would anyone else like to ask questions about alfalfa?

Member: It will not on the pasture of alfalfa early in the morning when there is no dew or rain on it. What would you do with alfalfa that has June grass in it?

Mr. Mills: I see no way but to plow it up. I have had a little experience, of course, but I am not very well posted on this matter. I had a piece that I sowed last Spring with oats, sowed six pecks of oats and 15 pounds of alfalfa to the acre. It came very nicely and was do-

ing well until along in the summer the oats got to about a time when they were ripe. I saw some alfalfa had turned a darker color. I feared the presence of the oats would injure the alfalfa and thought so much of the alfalfa that I went on with my machine and clipped the oats. About that time a protracted drouth came on and it was so severe that it seemed to burn the alfalfa right down; it was not protected as it had been by the oats and it burned to the ground. I examined it and thought it was killed but along in the middle of the summer we had two or three good rains and after those rains the alfalfa sprouted from the roots and came on a very good stand, but not as good a stand as I would like to have had. I thought this Spring I would go on with my disc harrow and stir up the soil considerably and then sow on more seed. I am going to try that. I have not done it so do not know what the results will be. My experience is that it does run the grass out a good deal. In my first crop last year, the year before I had treated as I advise and it grew wonderfully during that year; I sowed it the second day of June 1907 and it grew remarkably well but although I had tried to kill the weeds and supposed I had killed them, still they grew, and I clipped it twice, the last time I clipped it the weeds were fully two feet high. This last year when I cut the first crop there were a good many weeds but the second crop was entirely free from weeds and I have seen none since, so either the alfalfa crowded them out or my cutting them before the weeds matured killed them for they disappeared.

The Chairman: Is it common for June grass to smother out the alfalfa and take its place? I was down at Mr. Probert's place, near Jackson, last summer and he had one field where the June grass was getting pretty well established. I heard before June grass would crowd out anything you had on the farm. It is a persistent grower. I do not believe Mr. Mills could kill that June grass with a disc harrow. I think it would only cultivate it nicely. The only way to kill June grass is to plow it down and then it will come up again. Are there any other questions about alfalfa?

Mr. Clement: In Colorado I think they raise alfalfa for fertilizer.

Mr. Mills: Referring to the price of alfalfa hay, I saw a gentleman from Kansas last fall, when our best timothy hay was worth \$8 here, who said that alfalfa had a ready sale at that time at from \$13 to \$15 a ton.

The Chairman: Of course the supply and demand govern those things. If you have only a little alfalfa and there is a big demand for it, it will put up the price the same as anything else, but if everyone had more alfalfa than they could feed themselves it would probably sell cheaply.

Mr. Smearer: I would like to ask what kind of soil is best adapted for the growing of alfalfa?

The Chairman: I think Mr. Mills said any soil that would grow wheat or oats or corn.

Mr. Smearer: You say that clay is better than sand?

Mr. Mills: I think the stronger the ground is the better the alfalfa. If the clay is strong and rich perhaps it might be stronger ground than the sand.

The Chairman: There is one peculiar thing about alfalfa. It is

claimed it improves the soil but yet everyone wants to put it on rich soil.

Mr. Mills: Any plant will grow better on rich soil.

Mr. Smearer: Is there any danger of clipping the young plants at the wrong time?

Mr. Mills: I have experienced no danger. It came on very quickly each time that I clipped it.

The Chairman: Have you any special time to clip it or cut it?

Mr. Mills: I only judge that from what I have read. It is said that the proper time to cut it is when it shows there are a good many sprouts from the roots branching out, it is then ready to cut.

The Chairman: I think that is the rule, never cut alfalfa until the new crop seems to be starting from the ground.

Mr. Mills: Some say when 10 per cent of the blossoms are in that is the time.

Member: I have never raised alfalfa myself but I have been watching it and I have seen in one place where it would be well up and six inches from that it would not be up three inches and look as though it had been starved to death, under the same treatment, all thoroughly top dressed and handled the best they knew how. All through the fields you could see spaces where it did not seem to do anything, and that is one reason why I have not tried to raise it.

Mr. Mills: Some tell me that is because the ground is not sufficiently provided with bacteria. In the West it seems the land is generously provided, but here there are fields that are well provided with this bacteria and others that have none. In my own fields in some parts the alfalfa was dark, rich colored, and in other parts it would be light colored and not healthy, but the older the crops are the stronger they seem to get. The bacteria is increasing in number and spreading over the other parts, so my last cutting was the best.

The Chairman: You can buy the inoculation yourself from the government and it may not be evenly distributed. Perhaps some of those little plants do not live in some places and they do in others. I think the wonderful part is if you can get soil from some other alfalfa field it is better than to inoculate the seed.

Mr. Mills: That may be so but in this part of the country the farmers are very few who would want their meadows dug up to get the soil unless they happened to be plowing up a field. I was going to say another thing in regard to that. When Mr. Clark broke up his field that had not been strong with alfalfa he grew enormous crops of corn. He grew two crops in succession on that same ground, which would indicate that the ground must have been built up and fertilized by the presence of alfalfa.

Mr. Palmer: I was very much interested in this alfalfa question several years ago. I went into the sugar beet business a number of years to find out whether we wanted to raise them and if we did I wanted the beet pulp, but I never succeeded in getting the beet pulp to feed although I will tell you what I did succeed in, I succeeded in keeping up the fertility of the soil so I was enabled to raise red clover that I think would out number the tons to the acre of any alfalfa to the acre that has been told here today. I am quite interested at the present time in knowing whether this alfalfa would reach down and



fill the tile drains. I have gone on to a clay farm that is pretty well tiled out, but if the alfalfa roots would fill up those tile drains I do not want them. My opinion is that you can make a good clover hay if you take the pains and cut it in proper season that is almost equal to alfalfa. I do not know but I have read Mr. Lillie's remarks so long in regard to clover that I am pretty nearly a Lillie man on clover.

Member: It is a little out of the line of this discussion, but I would like to ask if any one has had any experience or if there have been any experiments made with this sweet clover that grows along the roads as a plant for building up the soil, or for much of anything in that line. What made me think about it was that driving the cows along the road last spring and summer they ate it ravenously and I wondered whether that clover had ever been tried.

Member: Speaking about this bacteria, two years ago we sent down to Washington to get the bacteria but they were all out, so I sent to a seed man at Toledo and he charged \$4 for bacteria, two dollars for clover and two dollars for alfalfa, but neither bacteria was any good.

The Chairman: Mr. Mills, can you answer this question, will the alfalfa roots stop up the tile drains?

Mr. Mills: I have not had personal experience. My land is tiled but I have only been growing alfalfa a little over a year. I have heard that question discussed in the papers and invariably the answer has been that it will not choke the tile drains if the tile is properly constructed, and it never will if the water runs down those tile drains continuously. Usually the tile drains are only used for the freshets.

Member: I would like to say one thing in regard to alfalfa roots getting into the tile drains. It has always been a question in my mind and last Fall when I was taking up some tile drains I found that where the water was running continuously roots had got in there and some of them had grown twenty feet long. Wherever I came to a drain with alfalfa over the drain those roots were in very bad and would have filled it up in time; where I found drains where there was no water except at a certain time of the year it was all right, but I hardly think I would dare to seed those fields with alfalfa where the drains had water running through them the year round.

The Chairman: There are few drains that run with water all year round. You know Professor Clinton D. Smith, who has given this subject a great deal of careful investigation, about the last thing he said before leaving the state was that alfalfa in Michigan yet was in an experimental stage and he was not sure whether alfalfa was going to make a success in Michigan or not. I now of fields of alfalfa right in Lenawee county which had good stands and then there came along a winter that killed every root of them.

Member: Will the alfalfa grow in the tiles only in dry times?

The Chairman: Ordinarily when it is dry there is no water in the tile and they will not grow there any more than they would anywhere else.

We will have to leave this now.

## PROFITS IN DAIRYING.

MR. COLON C. LILLIE, COOPERSVILLE.

I understand that I am on the program to talk on this subject. In my talk yesterday I covered a little of that and had I noticed that I was to address you this morning on this subject I would have left some things unsaid then and say them now. However, this subject is broad enough so we need not repeat it much anyway.

I am aware that a great many farmers in the state of Michigan do not believe that there is any profit in dairying. I have had considerable experience, through the agricultural press and through institute work traveling about the state and I have talked to a great many men, and I must confess that there are a number of men who do not believe, if you attempt to charge up to the cow what she costs and give her credit for what she produces, that there is very much in this question of dairying. I think, however, we can reason that there is a profit in dairying from the fact that so many people are engaged in dairying. I do not take it, my friends, that there would be thousands of people in this state and in all other states keeping cows year after year unless there were some profit in it. You might in a general way ask if there is any money in farming. I have heard people say there is no money in farming, and so have you; they say if we charged up the time we spend on the farms, the same as other business men do, that there would not be any profit in the business. I do not believe that. Those are people who do not take kindly to farming. Those are people that ought to be engaged in some other kind of business than farming. Now agriculture has to pay. There is no other way to do it at all, it has to be profitable. We do not have to be farmers unless we want to. We are farmers because we want a business to make a living and because we like that kind of business.

The population of this world must be fed and it has to be fed by the farmer's products. Farming must be profitable. We cannot have a prosperous nation unless we have a prosperous agriculture. That is the foundation of it, as was stated here last night by your county commissioner of schools. That is inevitable. It may be for some cause or another one or two crops for a certain time do not pay. For instance a few years ago the increased acreage of wheat was so large that wheat went down and many people did not think it was profitable to raise wheat because the demand was not equal to the supply, but since then we are getting better shaped to raise wheat profitably than ever before. That may be the case with dairy products. There may be a time when there is such an increase in dairy products, out of proportion to the consuming population, that for a time there will not be a profit in it, but that would be an abnormal condition and those things right themselves, because when people find they are not making anything out of a single crop they do not grow that crop and when enough come to that conclusion so there is a difference in the crop produced, prices will go up because we have to have the product.

Agriculture pays now, it has always paid and always will pay. It must pay because we have to have the products from the farm. If we figure farming on the same basis as we do manufacturing, we can make a larger per cent in farming for the money invested than we can in almost any other kind of business. From necessity we have to because the farmer has a small investment. The farmer only has a few thousand dollars invested and he has to make enough from those few thousand dollars to support himself and his family. If you had the same amount of money invested in real estate in the city, would it earn there enough to bring you as good a living as that investment in agriculture does? It would be a rare case, I think, where that would be true. If you figure the cost of raising wheat, if you get good crops you can make 40 per cent, 50 per cent or 100 per cent on the investment in growing wheat, and the same is true of any product that you grow on the farm. The reason the farmer does not get rich is because it does not seem to be possible for the farmer to manage a business that is big enough to make him rich in the modern acceptance of the term.

Now my dairy farm for the past four years has been run by hired labor, and it has had to be paid for. I have not been able to do anything on it. I visit the farm once a week, a very short time at that, and the rest of the supervision is done by telephone. I have to pay for every bit of labor and everything of that sort and yet I think I have made it pay. I have made it pay 6 per cent interest on a big investment. I could not begin to sell the farm for what we inventoried it at. We called the farm and live stock and tools worth \$25,000 and I could not sell it for that and I would not sell it for less. I would not know what to do with the money if I had it. I would rather keep it invested as it is; but after paying the farm hands, after paying all the help, after paying the taxes and everything else we cleared up, over and above everything, 6 per cent interest on \$25,000 investment from dairy farming. And I think that every other man who will look at it from that standpoint will agree with me that there is money in farming, that there is money in dairying.

Now dairying pays in more ways than one. In the first place this question that comes up in every farmers' meeting about keeping up the fertility of the soil. We in Michigan, especially in southern Michigan, ought to be and are very much interested in this proposition. We are no longer farming on virgin soil. We are farming on soil that has made one or two generations rich; they have not only obtained their living but they have laid up enough for a rainy day from the products of the original soil. They have not left that soil in as good a condition as they found it and we have to farm a little differently than our forefathers did to make equal profits with them, because we have to take the soil that the pioneer left and have got to farm in such a way that we will at least husband the fertility of the soil, and in many instances we have to build up the fertility of the soil before we can get as good returns from it as we ought. It is a very simple matter farming on a rich farm with a virgin soil. All that is necessary to do is to plow, reap and sow and mow. It is a laborer's job. A man who can do those physical operations can make a success out of farming in the Canadian northwest today. All he has to do is to get the

land, plow it, raise the crops and sell them, but after one or two generations a farm run in that way cannot produce a living for a man unless he has some brains to mix with the soil, and when you begin to mix brains with the soil in agriculture and figure how you will best improve the fertility of the soil, then the question of dairying comes into your mind.

Of course you will say that you can raise horses and feed all the crops you grow on your farms to horses and put the manure back on the land, thus preserving the fertility of the soil and you do, although when you sell the horses from the land you are selling more fertility. You can feed sheep and steers and husband the fertility of the soil, but, my friends, there is not a farmer in twenty in the state of Michigan that is fixed financially to undertake that kind of business. They have not money enough to raise horses and make a business of it; they have not money enough to feed sheep and feed cattle, it is too much of a speculation for the ordinary average man.

When I started out farming for myself I did not have any idea of being a commercial dairyman. My idea was to raise Shorthorn cattle and coach horses, and I had the courage of my convictions. I had lots of enthusiasm but I only got nicely started in raising coach horses before I found out that Lillie did not have money enough to do that business. We had to pay the hired men, we had to feed the family, and we could not get coach horses for three or four or five years to sell. This requires too long an investment, not that there is no money in raising coach horses for there is but the average farmer has not been able to do it. We once in a while hear of the ordinary farmer trying to raise trotting horses, but he cannot do it; he cannot go into it and make a business out of it. A man has to have a million dollars worth of capital to make a success out of growing trotting horses that are good for anything today. This feeding of sheep and lambs and cattle has too much speculation in it for the ordinary farmer. I dare not do it. You can wark all summer raising crops and storing them up in your barns, and when Fall comes you can go to south Omaha or Chicago and buy lambs, but before that you go to your banker and find out how much money you can get. You buy your lambs, bring them home and perhaps put a stiff mortgage on the farm to feed them until it is time to sell them. If you were lucky and bought on the right kind of market and if you are lucky and sell on the right kind of market, you will make some nice money; but the trouble is you are just as apt to be unlucky as lucky and if you buy on the wrong kind of market and sell on the wrong kind of market you will have nothing to show for your summer's work in raising that feed. The average man cannot afford to take that risk. If you have a good farm and have ten or fifteen thousand dollars out at interest you can afford to take it but if you go in debt on the farm and have to meet your payments I want to tell you there is a whole lot of risk in feeding lambs or in feeding steers, or anything of that sort. I have found that out by experience in the Shorthorn cattle business. I admired Shorthorn cattle above all other breeds. They are more pleasing to my eye and I tried to make a success of them, but I could not do it because I did not have the capital to do it. I could raise a Shorthorn up so he was saleable and ready

for service but I could not depend on selling that animal to pay the interest on a mortgage due the first of August. Perhaps it would be the next June before I could find a buyer for him. I could not afford to sell him for ordinary prices because I put too much money in the investment. They say "Necessity is the mother of invention" and certainly necessity compelled me to change my ideas of farming. I had to go into the kind of farming that brought me in cash, that I could turn over quicker and, against my own desires really, I went into dairying.

Dairying is a different kind of business from anything else that is in agriculture. I do not know of anything like it. The dairy business is a cash business but it is a cash business in a different sense from wheat or steer feeding or anything of that sort. You can say they are all cash businesses because when you get your things ready to sell you can sell them for cash, but the dairy business is different in that respect. Now then, potatoes on a good soil are a fine crop to raise, there is money in them, but you put all your time and investment in that crop and you do not get a cent out of it until you put your potatoes on the market and then you get cash for them; but in the dairy business you get money every week or every two weeks right along the year round. You have a business there that brings you in a steady uniform income that you can use in your business. A man can go into the dairy business on a smaller scale than he can in any other business in agriculture and do it right, and that is the reason why it pays the average farmer to have an investment in dairy cows. It makes him more thrifty.

I live in the fruit belt of western Michigan where there are probably natural advantages for the raising of fruit equal to anything in the world. I never realized what natural advantages Michigan had until I went down to Florida one time, among the orange groves, and when the people there found I came from near Grand Rapids, Michigan, they asked me all kinds of questions about fruit growing in western Michigan, and they could tell me about the natural advantages of western Michigan for fruit growing. It is so too. The winds from Lake Michigan keep back the fruit buds until steady warm weather comes and a man is surer of a crop of peaches in western Michigan than almost any place on this continent; and yet in western Michigan for a series of ten years, the man who pins his faith to a good herd of dairy cows is a great deal more prosperous than the man who pins his faith to commercial fruit growing. There is speculation in that.

I do not advise a man to go into western Michigan and run in debt for a farm to put in commercial fruit orchards. If he got a crop he would be all right, but if not he would be wrong financially. That is where dairying pays. It is a cash business, it is more certain than any kind of business in which you can engage, you can depend upon it. The dairyman has more credit than the ordinary farmer, he is entitled to more credit because he is in a different kind of business. I saw that illustrated one time down in our town of Coopersville. A man by the name of D. C. Oakes came down there and bought out a private banking business of the G. Watson estate. He knew nothing about the banking business in a country town. Of course a banker ought to know what his customers are doing. A banker has no right to loan out your money and my money without investigating the condition of the

man he is going to loan it to because it is his business to loan it to parties that he knows are absolutely reliable, and receive a fair rate of interest in return. It was said that when a farmer came into the bank Oaks would look through the window in the bank and see if he had milk on his breeches or boots and if he did Oaks met him with a "glad hand;" if he wanted to borrow a little money until harvest or something of that sort, he would say, "All right, sir, it is not necessary to have an endorser;" but if he looked out and saw there was no milk on the man's breeches or boots, Oaks had an entirely different greeting for him, and if he wanted to borrow a couple of hundred dollars until he sold his hay or had his steers fattened for market, Oaks would say, "We are running collections pretty close, I do not believe we could loan you \$200 but if you get an endorser I will let you have \$100." Oaks knew enough about farming to know the man who had a bunch of dairy cows on his farm was different from the farmer who raised timothy hay to sell, and he knew if he loaned the dairyman money to pay back in sixty or ninety days that man had a business that would bring him cash in that time and he knew what he was talking about, while the other man might not have timothy hay to sell when the time came and if he did have a good crop it might not be worth much to market when the interest was due. You cannot depend on those things, that is all there is to it, and Oaks knew also that the man who had hay to sell if he had cows to feed it to, would get more out of that hay by feeding it to the cows than by selling it.

There are a lot of those things that show to us that dairying is profitable beyond other kinds of farming that the ordinary man does not think about when we are talking about dairying. I tell you for the average farmer in the state of Michigan it is the best business that he can take hold of today. There is no doubt about it. Of course a great many people do not like to milk cows. They will do every conceivable thing to get into some business that is not as confining as dairying. I do not think, however, that part is worth arguing.

The time has come in Michigan agriculture when we have to have more business on our farms, we have to have bigger investments. The demand for money is greater than ever before, we have to have more business on the farm and when you have more business you have to do more work. I do not think you ought to try to do all that work yourself. I believe as a rule the farm owners work too much; I believe as a rule the proprietor of the farm acts more like a hired man than he does like the proprietor. I believe the average farmer in the state of Michigan works too much with his hands and too little with his head. He would make more money if he did not work so hard. He is afraid to make investments. I am not here to argue that the farmer is too good to work. I do not believe that at all, I know the nature of his calling is such that he must work with his head and with his hands but he cannot afford to work so hard physically that he incapacitates himself for working mentally. He can hire men to milk the cows and do the physical labor on the farm, but he cannot hire men to think for him. If there is any thinking about his business a man has to do it himself or it will not be done. I heard once at a farmers' institute that the best part of a farmer is that part above his ears, and I believe that

is right. There is a man today in our county that married a farmer's daughter. He was a railroad engineer. He got it into his head that it would be fun out on the farm so they went out on the farm but he could not make a success out of farming. He never employed men, did not know how to handle men, did not know anything about rotation of crops, did not know anything about the philosophy of agriculture, and he made a failure of the business, and went in debt on a good eighty acre farm; as good a farm as there is in our county. He worked and slaved but could not do anything because he did not know how. There are men, as I told him, that would have sat in a rocking chair on the front porch and made a good living off that farm. It is so, lots of men could hire every bit of their labor done and make a good deal better living than that man did farming, because they knew how and because they used their heads.

This farming in a new country on virgin soil does not require so very much thinking, but when you get down into the shape that we are getting into in Michigan today you will have to think about it, and we ought to think about it. I want to tell you the best lessons I got at the Agricultural College came about incidentally one day in class. It was not in the text books or in lectures. Good old gray headed Dr. Beale was hearing our class in landscape gardening and he was trying to impress upon the boys that if they became landscape gardeners and made a success out of it that they must study the landscape so well that they could see how it would look when it was developed. He said, "It will not do to put a drive here and some shrubbery here and after you have done to see that you have to make a change. You must study that so you will know how it is going to look after you get through with it," and then he turned to the class and said "Boys, when you go on your farms you will find it will pay you to take two days out of every week to study and think about farming, and do not take rainy days." Think of advising the average farmer today to take two days, a third of the entire time, to study and think about his business. Why, my friends, the older I get the more I believe that was not an extravagant statement of Dr. Beale's, and if the farmers of this state would take one third of the time to study, plan and think about their business that they would make more money than they do now; that they would be better satisfied with themselves and with agriculture in general. It is because we do not go at these things right and because we make slaves of ourselves physically on the farm, trying to do all the work ourselves, that we do not like agriculture and we become disgusted with it. It becomes nothing more than humdrum slavery. We have to mix a little gray matter in with the work and that is one reason why dairying pays, because you cannot have a dairy herd on your farm unless you use a little more gray matter than you do in ordinary farming, it compels you to do it. You have a business there that requires more thought and study from the growing of the feed for the dairy cow to the selling of the product, than any other kind of agriculture, and do not go into the dairy business unless you make up your mind that you will work a little less physically and do a little more with your head. If you do that you will make more money than you ever did before in farming.

I told you yesterday that dairying in the state of Michigan is profit-

able. We know it is so. The cow testing associations, which keep strict account of what each cow produces and what she costs, show that the ordinary dairyman in this state today is making a profit on dairying, that men are selling their crops to the cow and getting \$1.75 to \$1.85 for a dollar's worth of feed, which is more profitable than hauling those crops off the farm, and also saves the fertility. If you can sell clover hay to your cows on your farm for \$8 or \$10 a ton and get \$1.75 to \$1.85 for a dollar's worth of feed, the best cows will bring \$3 for a dollar's worth of feed, but under average conditions she will bring \$1.75 to \$1.85 for every dollar's worth of feed you give her, and there is money in that, and what is the limit? No man knows the limit. If under ordinary conditions with the ordinary cow you can make that, what could not a man do who will go at the business systematically and feed and develop his herd. It was told here yesterday that Governor Hoard had a herd of dairy cows that are producing 400 pounds of butterfat in a year, while those cows that return \$1.75 for every dollar's worth of feed will only produce on the average 200 pounds of butterfat, so there is nearly double the profit. It costs but little more for the feed, but little more for the care of a better class of cows, so we do not know what the limit is in the production of dairy cows. One man thinks he has gone to the limit in production yet in a few months after that somebody comes up who has exceeded that limit. It is like the speed of the trotting horses. Men thought they had the limit when they got a horse that could trot in 2:40 and yet they are getting them now to trot in two minutes and less.

I would not advise the farmers of Michigan to be exclusive dairy-men, to exclude every other kind of farming on their farm. I do not think that is the best plan for us. We have conditions here well suited for raising a variety of stuff. I think that every farmer in the state of Michigan who has a suitable soil and is within hauling distance to a beet sugar factory ought to raise sugar beets every year. I think that every man who has suitable soil ought to raise some potatoes every year in the state of Michigan and he can be a good dairy farmer and do that, but I think he ought to keep cows enough on his farm to consume all the roughage produced on the farm; whether he raises potatoes or sugar beets, I would not think he ought to attempt to raise all the grain for his cows on his own farm. My idea is that he would make more money raising this special crop of potatoes or sugar beets and taking some of that money to buy digestible protein outside the farm, than to attempt to grow it all on his own farm because if you attempt to grow it all on the farm you cannot keep cows enough to eat all the roughage.

I believe that a herd of good dairy cows on a farm simply brings in an added income to the farmer. To illustrate that. You are growing potatoes, sugar beets, wheat, oats, hay and corn and selling them. If you keep cows enough to eat all this roughage on the farm, that is you would not in one or two years, but in a series of ten or fifteen years you can keep this herd of dairy cows on your farm, feed all the roughage instead of selling it, and you can sell just as many dollar's worth of potatoes, just as many dollar's worth of wheat or sugar beets, or whatever the other crops are in that series of years, as you would if you did not keep the cows, and the income you get from the cow



is simply an added income, and there is not a farmer in the state of Michigan but can use all the added income he can get from his farm. In other words, the farm feeds the cow and the cow feeds the farm, keeps it up in fertility and you can get larger yields of those other crops than if you did not keep the cow. Consequently it is profitable in that way.

There are some other things that might be said along this line that I intended to say but it is 12 o'clock standard time and we will leave the discussion of this until after dinner.

The meeting then adjourned until 1:30 p. m.

---

#### THURSDAY AFTERNOON SESSION.

Meeting called to order at 1:30 p. m. by President Lillie, and opened with a vocal selection by the Ladies Quartette.

The Chairman: We will now discuss the question "Profits in Dairying." Mr. Paul Clement is to lead in that discussion. We will now listen to Mr. Clement.

#### DISCUSSION.

MR. PAUL CLEMENTS, TECUMSEH.

Mr. Chairman, Ladies and Gentlemen:

I believe there is not much left to discuss in this but there are one or two points I would like to speak about, especially as they effect our own vicinity. I think there are a great many people keeping cows in this vicinity that are not making a profit from those cows. While the farmers may be taking the best care of their cows that they know how and may be feeding the best they know how, I think they could do better. In fact I am sure of it for a great many of them are not getting results from their cows. Some of the cows are not of a dairy type.

I believe the farmers in this vicinity are making a mistake when they try to breed beef and dairy cows at the same time, for I do not believe it can be done. If there is such a thing as a milking strain in shorthorns I would like to see it. I have been on dairy farms and have a little experience, not as much as many of you, but I have seen some of the so-called "dairy strains" of shorthorns. I know a man who paid an enormous price for so-called shorthorn dairy cows with a milking strain, and he did not get them, and if there was such a thing as a "milking strain" it seems to me he would have got them with the prices he paid and the number of cows he bought. I think if some of the farmers in this locality would get a sire of a milking strain the cows would do

better. If they want to produce beef, the shorthorns are certainly a fine beef animal.

I think Mr. Hall said yesterday his cows brought him \$559 and when he started he could have bought some Guernseys. He did not state the price he paid for the shorthorns. I believe he said this was some ten years ago, and I believe if he had sold the shorthorns and bought something in the dairy line he would be money ahead today.

I do not pretend to keep many cows, I have a small place, just starting in. I have four cows now. I had seven but three of the cows were robbers, were not paying their board. One of those four cows freshened the first week in June, two in September and the other in November. The four cows during December made 137 pounds of butterfat which brought me \$44.14 at the local creamery. I am not a dairyman, am just starting in, but I have taken those four cows to start with and I am going to try by breeding them to a dairy sire, to raise something better. Whether I shall succeed time will tell. My cows are not any special breed, they are simply milkers that I bought from people that had good common cows. No registered stock or anything of that kind.

I think a great many of the cows in this locality could be made to do better if they were better fed. A cow can be fed too much but, as Mr. Lillie said yesterday, there are very few that are feeding too much, and I believe the feed and care are as important as the cow.

A man not far from here is building a silo. I asked how he liked his silo and he said he did not like it; that it was not giving the results. That man had seven cows and fed them all the ensilage they could eat and a bunch of corn stalks, and that is all he fed them. Can you wonder that he did not get results? I do not believe that man used common sense. I think if a great many would stop and figure a little before they fed they would get better returns.

The Chairman: This subject is open for general discussion. We will be glad to hear from anyone. If you do not care to discuss this further, perhaps we had better pass on to the next, and we will now listen to Mr. Palmer on "Local Dairy Conditions: How to Improve Them."

## LOCAL DAIRY CONDITIONS: HOW TO IMPROVE THEM.

MR. E. G. PALMER, TECUMSEH.

Mr. Chairman, Ladies and Gentlemen:

When the program committee asked me to speak on this subject I was very much surprised because my knowledge of the conditions of the dairies surrounding this place is very limited. However, the more I study the cow question the less I seem to know for I am convinced, using a part of a scriptural verse that "Eye hath not seen, nor ear heard, neither hath it entered into the heart of man" the true value of a good dairy cow. That leads us to the question that is before us, what constitutes a dairy. Now is evidently not a herd of cows, that is not the idea that we first get from it. A gentleman living not far from this

village, he may be here today, told me when I was on his farm that he had a herd of twenty-four cows but he said "I am only milking one." He had that strain of dairy cows that Brother Hall told us about yesterday, Shorthorns. No doubt he was getting pleasure from keeping those cows, but I would not consider that as a dairy, would you Mr. Chairman? Hardly so. Then the thought comes what constitutes a dairy, and it can be no more or less than producing milk at a profit, or the profits that are derived from the milk. Now then, is that not true in almost any particular line that we take up, and especially is it true of farming, it is either conducted at a profit or a loss, and I am afraid there are few of us that know exactly whether it is a profit or a loss in very many of our modes of farming. There are too many of us something like the Nebraskan I read about in this week's Hoard's Dairyman. He said he knew there was not anything in the dairy business but he would give it a fair trial. He had a few native cows and he purchased a separator, a shotgun, a running horse, a stove, a Hereford sire and two gallons of booze and then he was ready for business. We all know just about how well he succeeded. Of course it was only a short time before he pronounced dairying a flat failure and it was to him as it would be to any person who started out in that line. There is nothing that succeeded like success, making a success of the undertaking that you start out with.

Now as to local conditions, I am afraid there are too many of us like the father of the boy the minister passed, when he was traveling on the road. He said to the boy "Would you like a ride?" The boy said "Yes." The minister got into conversation with the boy and finally he said "My boy, is your father a Christian?"—"Yes Sir, but he has not been doing much at it lately," so I suppose that is the way with most of us. Are you dairymen? Yes sir, but we have not been doing much about it lately. I think that about sizes up the local conditions as well as anything. We are not in a strictly dairy community. We all keep cows of course, but I do not think this can be considered a strictly dairy community.

Then as to the latter part of the subject—how to improve this. This you have heard. It is the same thing line upon line, here a little and there a little. There are set rules whereby our conditions may be improved and all I can do is to reiterate some of the things, and perhaps you will bring up the rest in the discussion, which I hope will be full and satisfactory.

In the first place it seems to me that anyone starting in the dairy business must have an ideal. Mr. Clement brought that out in his discussion of the former subject, that he has an objective point to which he is looking forward. In any line we must have an objective point. Take the sculptor, he has before him a great mass of granite. Now if he did not have in his mind an ideal of that which he was to produce he would make nothing out of it whatever, but having that ideal he begins to hammer and to cut, to knock off a piece here and another piece there, until finally we behold the statute. So with the painter; here is his canvas, here is his paint and brush and there is nothing to you or me that has any soul in that work, that has any ideal in it, but he puts a daub here and a daub there, and bye and bye we have a beautiful masterpiece. He had an ideal. So it seems to me in the dairy

business if we are to succeed at all we must have an objective point and make everything bend to that end.

Then some say it is too expensive to build a dairy, they said "I would like to have a dairy but it is too expensive." I do not think it is necessary at all at the beginning, although it may be an advantage, to pay big money for thoroughbred stock, yet I believe that every farmer who can afford it (and perhaps we could all if we only thought so) should breed thoroughbred stock just as quickly as he can. I do not believe they eat any more and I believe we get better results. But to begin with, there are three words that will sum it all up, to weigh, to test and to sell. In order to know what your cows are worth you must weigh the milk. I do not know that it is necessary to weigh every milking in order to get their approximate average, but say three times a month. Our milk is weighed three times a month, on the 5th and the 15th and the 25th and then we strike the average, and that seems to me to be better than to weigh it the 14th, 15th, and 16th as I have seen advocated in the dairy papers. Then the test, if you have not a tester the creamery will be only too glad to test your cows, and as soon as you have followed that plan a few months, weighing your milk and having it tested, you will then begin to know what your cows are worth to you.

Then comes up the other subject of what breed will I select. There is the question, what do you want? Beef or butter? Here is a man looking for a horse. What kind of horse does he want? A horse to put on the plow or a horse to hitch to his buggy to drive to town? There is a marked distinction between the two. If we are after butterfat then we must get that breed that is especially bred for the purpose. If we wanted a trotting horse we would not go and buy a Belgium or some heavy horse, we would want them for the plow. We have a Belgium horse in our neighborhood and we would not want him to enter in a race against some sleek horse on the street, but put him on the plow beside them and he will show up in good shape. That is what he is bred for, that is his purpose. He is a heavy draft horse, and it has come to the point in dairying that those distinct breeds are especially for butter, and if we want that thing we must work to that end.

Then of course comes the subject of feeding. The cow is a machine, and we want that cow that will consume the most and produce the most for the least expense. As we were told yesterday, two cows standing side by side, one returned 56 cents on every dollar's worth that she ate and the other a little over \$3 for every dollar's worth she ate. There is the difference. It is the same with lots of soil. Some times the more we put on some soil the worse off we are because there is not that inherent virtue in the soil that will produce crops. The same is true of cattle, if we fed some cows gold dollars they would give us nothing but coppers in return, therefore it is necessary to first select the breed, then have careful feeding and good care. Strawstack-fed cows usually are not very valuable. Mr. Clement said the gentleman that fed ensilage and a bunch of cornstalks thought that was about all the cow required, but remember a good warm stable, a light, well ventilated stable and the very best of care we can give a cow is what she will appreciate and return to us a profit in the milk pail. Google

You know an old prophet many years ago said "My people are destroyed for lack of knowledge" and I think that proverb is still true in every line of avocation today. It is the man that studies, the man that endeavors to improve his mind that ultimately reaches the goal.

The Chairman: The discussion of this subject will be led by Mr. Powers.

## DISCUSSION.

MR. E. S. POWERS, RAVENNA.

The president says there is not much of a chance for me to have anything to say after that talk, and I believe that what we have heard here has pointed out one of the ways of improving the dairy condition. Getting together, talking and having these discussions among yourselves creates an interest in the business.

I cannot give such an eloquent talk as Brother Palmer but I know what he said is true that in order to obtain the greatest success in any line of business a man must have an ideal, and he must have a love for the work to get the greatest amount of success out of it. There is no question about that. You can see that in every day life. When you see a man that loves a good horse you will see his eyes fairly glitter when he looks at a fine horse. I used to wonder when I saw my father stand and look at a bunch of heifers that he had raised. I used to wonder what pleasure he had in that. He would look them over and over but you can look around today and see the financiers of the country when they want a little pleasure, after they have had everything the city can afford, they turn to dairying, stock raising or something of that sort to get satisfaction. There seems to be a whole lot of satisfaction in it.

I think if you look around the state of Michigan today you will not find many farmers, as a rule, that are not in love with their work if they are milking cows. They simply keep cows for a side issue. They know the cows bring us a little money but they are not enough interested in the matter to find out how much they could do. There is no question but there are lots of good preachers spoiled that would have made good farmers. They tell a story about a young man that started out preaching. He came to his native town a few years ago and preached a sermon. Afterwards he asked a friend what he thought of the sermon and the friend said, "It was very good. How did you happen to become a preacher?" The young man said, "Well, I don't know how it happened but I woke up one night with a grand inspiration and I could see the letters P. C. I thought it over in my mind and I could not think of anything else but that it meant "Preach Christ" and from that time I have tried to devote my whole attention to preaching." Well, the friend said, "I hate to discourage you but I believe you took a wrong meaning out of those letters. I believe they meant "Plant corn." So I think a lot of ministers have been spoiled who would have made good farmers.

The question of how to improve local dairy conditions is something that is puzzling me, and something that I have studied more than any other subject connected with my business, how I could in my vicinity get the farmers to become more interested in the dairy business, and I tell you that I have begun to believe that we have to rear especially bred dairymen in order to get them enthusiastic in the dairy business. They have to be reared with a knowledge of the farm. Down east we never had any trouble with the hired men milking, because just as soon as a boy was big enough to put on a milk stool and milk a cow he had to milk. My father kept forty cows and just as soon as the children were big enough we had to go out and milk. I was very glad when I was big enough to milk a cow but a little later I was sorry. After my father left the farm I worked on other farms and I remember in one instance the farmer I worked for had typhoid fever; he kept thirty cows and his wife and I milked those cows night and morning for three months and I think we could have done it longer. I did not hear any complaint from the lady and it kept me busy to milk my fifteen cows as fast as she milked hers, but she had the advantage of me because she knew the easy milkers. When I took the milk to the factory she got the breakfast. Now I was pleased when I could do the milking and I never thought of dreading the milking. That is why I am in favor of starting some agricultural training in our district schools, as was discussed last night by your county superintendent. I believe agriculture has to be taught to the children in order to get them to understand and love it. Of course I do not mean to claim that every boy or man will always have a love for stock but I believe more of the boys raised on the farm today would take more interest in the farm if there were more inducements there for them, than merely the plowing, sowing, reaping and harvesting. They have to have something else on their minds. A traveling man told me the other day that he lives in Grand Rapids. He has eighty hens and his boy became interested in the chicken business. He studied the different breeds, tried first one breed and then another and finally settled on one breed of chickens. He fixed up a place for the chickens, after studying how to keep it warm, etc., and in December he got from those ten hens something like 275 eggs. Now that is a big story for this time of year, but it shows that the more interest you put in your work the more you will get out of it, no matter whether it is the chicken business, the dairy business, the horse business or any business, the more attention you give the more you will get out of it.

I do not believe it is necessary to say much more on this subject of how to improve local dairy conditions until you can get your farmers here and agitate these questions. If a farmer sees you are making money in the dairy business he will want to start in it too. Mr. Hall said yesterday he took cows that were not especially dairy bred and still made 40 per cent on the money invested. Here is a gentleman that just told you what he received from his four cows. He must have received nearly 80 per cent profit. What business man that is looking for an investment will not accept something that will return him 3 per cent or 4 per cent? I wonder if the dairy business is not pretty good. It looks good to me.

As I said before, I do not know of anything that will create an in-

terest or help the dairy business more than the enthusiasm that you can create in the neighborhood and get the farmers started. That has done wonders in the vicinity where I have been. I know the good that has been derived from frequent meetings just among ourselves: I do not believe that I care to take any more of your time.

The Chairman: This question is now open for general discussion. What are the local dairy conditions here?

Member: I would like to have Mr. Birdsall answer that question.

Mr. Birdsall: I think Mr. Hall, Mr. Clement and Mr. Palmer have gone over that pretty well. I think the development along that line can be noticed comparing this meeting with the one we had here some time ago under the auspices of the State Dairy & Food Department.

The Chairman: You are a manufacturer here, you are interested in the manufacture of dairy products. If you could make changes in this community, would you have the farmers do things they are not doing now? In other words, what are the local conditions?

Mr. Birdsall: In getting them interested in it they are taking up the work to a greater extent, and perhaps what has done as much as anything to help the local dairy conditions is a proper knowledge of just what they are getting out of it. What the cost is and what returns they receive.

The Chairman: What is the size of the average herd of cows kept by the patrons of your creamery?

Mr. Birdsall: Five to seven; seven cows would be quite a large average. Of course we have several large herds, large dairies from which we receive cream but not right here. We have one large dairy herd in Olnsted. There are only two or three in this vicinity that are interested at all extensively in the dairy business.

The Chairman: How many of your patrons have special purpose dairy cows?

Mr. Birdsall: I believe Mr. Hall says he has one, but there are very few. I do not know that there are any special purpose dairy cows in this locality.

The Chairman: How many of your patrons that you know of have registered dairy sires?

Mr. Birdsall: There are three registered dairy sires.

The Chairman: The average of the herds is about seven. How many of your patrons have silos?

Mr. Birdsall: I cannot answer that question outside of the vicinity of Tecumseh, but perhaps there are not more than five or six within a radius of five miles of Tecumseh. I believe Mr. Skinner at Olnsted has two. We also have some patrons from Addison that I believe have silos. We have one man at Addison whose check runs up to about \$100 a month, so he must have some cows, I do not know just how many.

The Chairman: According to your statement, there are few silos in this community.

Mr. Birdsall: Very few silos. Mr. Eckel, who supplies cream for the local trade here, has a silo and Jersey cows. I do not know that his cows are registered but I know he has given a good deal of attention to the Jerseys, but the creamery only gets his surplus cream. There is another man, Mr. McNeal, who has given a good deal of attention to the Jerseys and I think has a registered Jersey sire.

The Chairman: How many farmers in this vicinity that you know of have taken any great pains to ventilate their stables, but in the King system or some other system of ventilation?

Mr. Birdsall: I do not know of any King system of ventilation at all. I do not know of any effort made along that line. Mr. McNeal has the model stalls and has as good a stable as I have ever seen. I was down there once in May when he had fourteen Jersey cows, and I could not see a stable stain on them. As far as ventilation is concerned, I do not think he has any special system any more than the hay shute but he seemed to have plenty of light.

Member: Have the hand separators improved the dairy conditions any?

Mr. Birdsall: I think the separators have improved conditions here from a financial standpoint. The gathering of milk was too expensive and the hand separator has reduced that by allowing the patrons to receive more and better returns for their milk by lessening the cost of transportation, but in other ways I do not think the separators have made any material difference. It has made at least 25 per cent difference in the cost of production.

The Chairman: Are there any other suggestions or anything further to be said on the subject of local creamery conditions and how to improve them?

Mr. Palmer: I might say one word and that is I believe many farmers are endeavoring to carry on a dairy that have not enough interest in it and furthermore they think they know so much there is nothing further to be learned. I was in a store at Lenawee Junction the other morning and was talking about this Association; I was trying to find out what was the general opinion of it. Some said, "It does not make any difference, if you go there you cannot learn anything. They can tell us things but we do not learn anything." I tell you the man that goes to a dairy meeting and does not learn anything must be short above his ears.

The Chairman: Of course you have a prosperous creamery here from a business standpoint. They are making a nice lot of butter and one would naturally expect that the dairies in this vicinity would average more than seven cows to the farmer. You must have to reach out quite a ways to get your raw material?

Mr. Birdsall: I have to go 25 miles.

The Chairman: Farmers ought to keep more on the average than seven cows or ought to go out of the business. That is my ideal from a practical standpoint. You cannot afford to keep as few cows as that. That means that some of you are only keeping two or three cows, some of you are keeping ten or twelve, but many are only keeping two or three cows. It costs money to run a dairy of two or three cows. You cannot afford to go yourself nor send your hired man into the back pasture after two or three cows to get them up to milk. There is not money enough in it, friends. You do not get anything out of it. You do not realize anything out of it. A man has to be there every morning and every night to take care of two or three cows. I would sell them to the other fellow, I would not have a cow on my farm if I did not have more than that number. There is no money in it, you cannot afford to do it. I would keep cows enough on the farm so I could afford to have



a hired man to help me out. One time at a dairy meeting I was talking about dairying and of course they suggested that it would be all right for a man like Lillie to talk about dairying because he did not have to milk the cows and did not have to keep his nose to the grindstone 365 days in the year. There is something in that but as long as you keep three or four or five cows on your farm your nose will always be to the grindstone. You have not enough investment so you can keep it off the grindstone, but if you have some investment so you have income enough to have help to take care of those things you will make more money out of it. You do not pay much attention to three or four cows on a farm. You will never get interested in dairying until you have cows enough and have a sufficiently large investment so that you will realize something out of it. In my opinion the greatest object to improve the local conditions is to increase your investments in dairying and then you will begin to see some thing in it.

There is a reason why there are not more silos in this community. You do not keep cows enough so you can afford to have silos. You cannot have silos with three or four cows. The ensilage would all rot down. You have to feed the ensilage off the top at a certain rate and you cannot have those things unless you have a bigger investment, and this idea of having to go a radius of twenty-five miles to get cream enough to run the creamery makes it cost too much to get the stuff. Mr. Birdsell is a pretty good fellow, but Birdsall does not pay for collecting this stuff, the farmers have to pay for it. There is no question about that. Birdsall cannot afford to pay for it, he has to figure on that. I have always been taught to believe that Lenawee county was a great dairy county but it does not look to me, understanding something about the local conditions, that you have very much faith in the dairy cow down here in Lenawee county. Why, our dairymen in Ottawa county have twice as much faith in the dairy cow as you have down here. They have faith enough in the dairy cows to own some of them and take care of them. Lenawee county has always been held up as the banner dairy county but Ottawa county produces more creamery butter than any county in the state of Michigan today, and our Dutch farmers up there have faith in the dairy cow and she is making them prosperous. You want the silo but you cannot afford the silo with a real small dairy.

Mr. Hall: I hate to see Lenawee county attacked in that way. Twelve years ago I canvassed Lenawee county for a farmers insurance company and I found this fact. As you know, the southern part of Lenawee county produced more cheese at that time than any other county in the state of Michigan and pretty nearly more than the rest of the state of Michigan and they are in the cheese business today. I found that the farmers of northern Lenawee county were hard up, hardly knew where to get money enough to pay their taxes, while the farmers of the southern part of the county did not know what hard times were. They have kept dairy cows down there and they have made a profit out of their farms. Talk about a man being tied to a dairy cow, three years ago I was talking to Mr. Horton about the Grange. At the Tecumseh Grange we could hardly get the farmers in to hold a meeting at 8 o'clock and Mr Horton said that in a dairy district, where every

man was a dairyman, had thirty, forty and up to seventy cows, every man would be at the Grange before sunset.

Dr. Bramble: I will not go back on northern Lenawee. If anybody has been down in southern Lenawee county he knows that they have the virgin soil and it does not take much brains to raise cheese down in southern Lenawee, but it does take brains to raise butter in northern Lenawee.

The Chairman: There is no question but a man has to have brains, and you all have brains here but you do not use them.

Mr. McConnel: I was born in southern Lenawee county and lived there until I was twenty-one years old. I milked cows there from the time I was able to carry a milk pail until I moved away and I know something about the conditions of southern Lenawee as well as northern Lenawee, and I know the reason why northern Lenawee county has never depended on the dairy cow. We undertook the dairy business here and I believe it is no more work to milk cows than to do anything else. I milked before fifteen years old twenty-one cows at a sitting, but down in southern Lenawee county they had a market for their product. There is the solution of the whole problem of this dairy business in Lenawee county. In the northern part of this county up to the present time we have never had a reasonable market for our product.

The Chairman: You have had a creamery for twenty years.

Mr. McConnell: I was just going to tell you what kind of a creamery we have had. This creamery was established first and went to the wall. Then one was built at Holloway and I put in a few cows. Well the fact of the matter was, for some reason or other, the man that handled those creameries did not get hold of it right because we did not get the returns we should have had for our milk. We would get some butter from the creamery and at the end of the month, instead of getting a check, we would get a note saying we owed something. Another thing that discouraged the farmers was bringing the milk to the factory and bringing it back, and when the milk came back it was frequently unfit for any use. But I do believe the hand separator is the right thing and I believe the home cream separator is going to do a great deal for the dairy interests in this section of the county. I believe those people who are in the dairy business now will soon set an example that will be followed. That is my opinion of the situation. But the reason we have not done more dairying is because we have not had a market for our property and the business was not paying. If it was paying the people in northern Lenawee county would take hold of it as quickly as anybody.

The Chairman: A creamery cannot pay unless the farmers support it. You cannot make money in a creamery unless there is raw material to make butter. There was scarcely ever a creamery failed that it was not the fault of the farmers in the vicinity. There is nothing wrong with a good co-operative creamery if the farmers will only support it. The farmer can have as good a market at his door as he will make. If you can support it and supply good raw material, you can get as good prices for your butterfat as can be paid anywhere in the world.

Mr. Palmer: Why is it that we are getting better prices for our butterfat now than we were under the old regime before Mr. Birdsall got hold of the creamery?

The chairman: You were in the whole milk business then and it cost a good deal more to deliver the whole milk. Now you have gone over to the hand separator, the creamery can reach out farther and get more raw material. You are making more butter now than you did before.

Mr. Birdsall: We are making more butter than was ever made here at this time of year, to my knowledge.

The Chairman: You have to have a certain amount of business to pay your expenses. The cost of transportation of milk and cream would make quite a little difference in the amount of the check you got for your product. Of course butter prices are better now than they were then. Dairy products are worth more money today than they were a few years ago. There is that to take into consideration, but I find there is one thing, that the farmer is always looking at the quarter of a cent a pound that he thinks he ought to get that he does not get from the creamery, and he ignores the five or ten cents a pound he loses on his farm. Even when the creamery management pays the farmer a good price he is never satisfied but I do not claim about that because we want all that we can get, but the half cent that he does not get that he thinks he ought is nothing compared to what the average man is losing on his own farm because he does not take more interest in his dairy. I am glad, however, to know that the local conditions in this vicinity are improving.

Mr. J. B. Hill: Referring to the matter of silos, I have called on a great many farmers in the last ten or twelve years, and your speaking of Ottawa county reminds me of what I have to say. Every farmer up there, with scarcely an exception, has a silo, and you can see a big difference in the creameries there. The creameries do not have to go twenty-five miles for material. A creamery that reaches out three or four miles has a big business. Every three or four miles there is a creamery and they all do a nice business. The farmers up there are in a prosperous condition and I would like to see it that way all over the state.

Mr. Birdsall: I was in Ottawa county last fall and I noticed in talking to the manager of the Coopersville Creamery, while the number of patrons was larger than ours the make was not correspondingly larger. They were making about three pounds of butter to our one pound, but Mr. Dubendorf said he had five or six hundred patrons while we had something like one hundred.

The Chairman: The farmers up in northern Ottawa do not keep the cows per farm that the farmers do in southern Ottawa. There are more Yankees in northern Ottawa that do not like to keep cows unless they have to. Our creamery had to reach out too far to get its supply, although the manager stretched it a little when he told you the number of patrons. I do not think he has quite as many as that.

Mr. Birdsall: Perhaps I should not have made the statement that he actually said he had that number, but I think he said something about making out five or six hundred statements, and that is how I got the impression. It surprised me to think they were not producing more goods in proportion to the number of patrons.

The Chairman: We have not in our community enough dairy enthusiasm any more than you have here. There is no question about that. Southern Ottawa has more dairy enthusiasm than northern Ottawa

because there are more natural born dairymen, there, such as Mr. Powers was talking about, that were brought up in the dairy business and understand it, and are making money out of it. In northern Ottawa you will find lots of silos.

If there is nothing further to be said we will now take up the question box.

### QUESTION BOX.

Question No. 1. Would you advise a milking machine if a man had twenty cows?

Mr. Lillie: I do not recommend anyone to buy a milking machine because you have to investigate them carefully before you buy one.

Question No. 2. How many cows must a man have to afford to use a milking machine?

Mr. Lillie: I do not know that. I should say that he ought to have twenty cows or more anyway in order to have a milking machine practical, because if you use one machine you want three or four machines. You want enough so one man can be busy operating them, otherwise they would not pay you.

Question No. 3. Is it profitable to veal calves on their own mother with butterfat at thirty cents and veal at  $6\frac{1}{2}$  cents a pound?

Mr. Lillie: I would say that never would be profitable. Don't you ever fatten any calves on dairy cows. If you are going to fatten calves, milk the cow by hand and feed the calf the milk, or else knock the calf in the head. It takes about four weeks to get a calf in condition to sell. The first several milkings of the cow are not fit for food anyway. You are going to lose that anyway and I am inclined to think I should make it a practice, if I had grade cows, to veal the calves, rather than knocking them in the head. All you have to do is to feed it until it gets fat and mature enough to make veal.

Mr. Palmer: For a number of years I used to veal calves for the simple reason that we made up our minds it was too hard work for my wife to make the butter, and I kept at the business until I got seventeen cows and could not get calves enough to keep the thing running, but I know I weighed the milk time and again that I fed to the calves and noted their gain. It takes on an average fifteen pounds of milk to make one pound of gain on the calf, so you can judge whether you can afford to carry on that kind of business or veal the calves. Butterfat at 25 cents is worth more than to undertake to veal calves, when it takes 15 pounds of milk to make 1 pound of veal at  $6\frac{1}{2}$  cents.

The Chairman: Pretty poor milk, wasn't it?

Mr. Palmer: You can have too rich milk to feed your calves, and you can do better on a poor quality of milk fattening calves than you can making butter.

Mr. Birdsall: I have been reading Henry's Feeds and Feeding, and it is claimed in that book that it takes twelve pounds of skim milk for one pound of gain on the calf.

The Chairman: Mr. Palmer says it takes fifteen pounds of whole milk.

Mr. Birdsall: The article I referred to was some experiment conducted at the Wisconsin Experiment station.

The Chairman: All experiment stations have done a little work on that line but the figures found in Henry's Feeds and Feeding and the question of age are the factors that make up the amount required. For instance, it may vary from two pounds to ten pounds, depending on whether you have a calf at one week old or two weeks old, the older a calf gets the more milk it takes to make a pound of gain. There is another factor, and that is that it takes more dry matter to make a pound of gain in an old calf than in a young one because 80 per cent of the newly born calf's weight may be water, while in the adult animal not more than 50 per cent is, so it does not take as much dry matter to make a pound of increase in live weight with the very young calf as with the old one. So you see in figuring, the question of age is the one factor that determines and it will vary, depending on whether you are feeding a calf a week old or five weeks old.

The Chairman: Professor Shaw, what would be your opinion as to this question? Could a man afford to veal his calves or had he better knock them in the head?

Prof. Shaw: That depends upon a good many factors. One of the New England experiment stations has worked out experiments and Beach had done a great deal of work along that line. He has taken the cost of production week after week, from one week up to twelve weeks, and at the end of four weeks he would show what the value of the butter would be in pounds that the calf has consumed and what that calf would be worth on the veal market, and as we go along we find the price on butter diminishes and the further we go along the less the profit on the veal calf. He reaches a maximum at about somewhere between four and six weeks. After he gets past that his veal profits begin to go down and down until he has nothing.

The Chairman: A calf should be in shape to sell at four weeks old.

Prof. Shaw: That depends on a great many things.

The Chairman: I do not sell very much veal but I sold my herd down this fall so I had to buy thirteen native cows to fill the barn this winter, and the thirteen calves from those cows were vealed and they averaged us eight or ten dollars at the end of four weeks old, but I did not get six and one-half cents for the veal, I got eight cents a pound live weight. That brings in nearly ten dollars a month for the cow and that is all we would get out of them to milk.

Member: I asked that question. My point is whether a calf is not better on its own mother than it would be to buy calves here and there and putting them on the cow. Wouldn't that be harder on the cow than its own calf?

The chairman: You are speaking of allowing the calf to suck the cow. I would not do that under any consideration.

Member: They tell me you cannot get them any other way.

The Chairman: You can get them to sell for eight cents live weight. I never saw a cow yet where the calf was allowed to suck for three or four weeks where the cow did as well and gave as much milk through

period of lactation as if you took the calf away from her when a day or two old. The cows will shrink in their milk the best we can do and never come back.

Mr. Palmer: I would like to ask Professor Shaw a question. Does not the majority of milk contain too much butterfat to make a good calf?

Prof. Shaw: I would not like to say that the majority of milk has, but some milk has. The milk of some breeds have a little too much fat for good calf work. That is my personal opinion.

Question No. 4. Why should not the creamery pay as much for cream from gravity separators, when received in as good condition as for hand separator cream?

The Chairman: Mr. Birdsall ought to answer that question.

Mr. Birdsall: That is a question I have to answer every little while.

The gravity cream system has been tried out here in this village and found to be a failure, but we have consented to take some gravity cream from people that we thought were careful with it and I think they have brought it in in good shape. We have taken it because they did not have separators and some of them thought they could not afford to put in separators just at the present time, and I have seen no ill effects from taking gravity cream. We have allowed them one cent less for the gravity cream.

The Chairman: This question is why you deducted the one cent.

Member: I asked that question. I meant the deep setting system.

Mr. Birdsall: I was pretty well satisfied who asked the question. I think there are one or two other people in the same locality that send us gravity cream. It comes in in good shape but we have not felt that we could foster and encourage the delivering of gravity cream. We do not care to, hence the difference in price. Of course we are glad to get this cream as long as it comes in in nice condition.

The Chairman: Mr. Powers, if a patron brought you a can of gravity cream and you took it, tested it and found it was in good condition, would you pay as much for it as for hand separator cream?

Mr. Powers: Yes sir.

The Chairman: You would not care how they got the cream as long as they brought it to you in good condition?

Mr. Powers: I have had considerable gravity cream and the only objection I have to it it is not quite heavy enough. I found gravity cream, where well taken care of, came in in many instances better than the hand separator cream for the reason that the gravity cream separators do not clean as hard, so they are cleaned, while a lot of the hand separators are neglected.

The Chairman: They also keep gravity cream colder because they have to have cold water around the milk to get the cream at all. I think Mr. Powers has given the only objection that can be brought to gravity cream from the creamery standpoint, and that is that it is liable to be too thin so when you want to use commercial starter in your butter you cannot use as much starter as you like to get exhaustive churning.

Mr. Birdsall: Mr. Powers, speaking of the difference in that cream, would you turn down gravity cream that was 15 per cent fat or would

you pay the same as for nice gravity cream that tested 25 per cent or 30 per cent?

Mr. Powers: I would encourage them to skim a thicker cream than 15 per cent. I should certainly draw the line on anything like that, but still we have had it brought in at 15 per cent. The man who uses the gravity system is the loser and I believe it is the creamery man's duty to show him his loss. I know I sold a separator to a patron who had been using the gravity system and he has been more than pleased with the change, he found he got so much more cream with the hand separator than with the gravity system, but the 15 per cent cream is a little light. We have it so it does not go much below 20 per cent.

Mr. Birdsall: We have made that difference not so much because Mr. Wheeland's cream was not worth as much as the hand separator cream but we did not feel that we could make a distinction between Mr. Wheeland's gravity cream that tested 30 per cent and Mr. B's cream that tested 15 per cent.

The Chairman: One or two creameries over here handling gravity cream would not make any difference anyway. This gravity process is gradually going out, is it not?

Question No. 5. Has Mr. Lillie had his dairy herd tuberculin tested? What did he do with those that reacted?

Mr. Lillie: Mr. Lillie has never had his herd tuberculin tested, consequently none of them reacted. I suppose I am not up to date on that question. I never felt like taking medicine myself as long as I looked well and felt well and could do business and I never thought other people ought to; I never thought it was necessary to test my herd of cows when none of them was sick and were doing business, looked thrifty and happy and apparently well. I am a little old fashioned on that notion, I presume. I have sold animals for breeding purposes when the buyer knew they were not tuberculin tested and I told him if they reacted I would take them back and refund his money, but none of them has come back. I have no conscientious scruples about giving people milk that might give them tuberculosis because my milk is separated on the farm and pasteurized before it is made into butter. My hogs, calves and sheep do not look as though they were injured any by the skim milk. I do not know that I ought to say it, but I think there is a whole lot of nonsense about this tuberculosis. I do not think that people are in such great danger of being killed by tuberculosis as some of those scientific men try to make us believe. That is my candid opinion.

Question 6. Is a silo practical on a forty acre farm? Can a man raise enough feed on a forty acre farm for twenty cows?

The Chairman: There is no question about it. He can raise roughage enough on a forty acre farm for forty cows if he is a good enough farmer. There is no doubt about that at all. Mr. Dedreich raised forage enough on fifteen acres for thirty-four head of live stock and had hay to sell. Seventeen head of those were milk cows. He had more hay than he needed. There is a limit to the number of cows a man can keep on a farm but none of us know what that limit is any more than does a man know the limit of production in a dairy cow.

Question No. 7. Can dairy cows be kept in good breeding condition

fed on corn silage and hay the year round, without any pasture, the grain to be cottonseed meal?

The Chairman: Yes, they can be kept in just as good condition as out in the pasture, this man Dedreich proved that. He did not have any pasture at all, he did not even have an exercise place, only little yards something like stalls into which the cows would run while the stables were being cleaned, then they were put back into the stalls. He not only kept cows there the year round but he fed those cows, raised the calves until they were mature cows, and they were all healthy and producers and he made an improvement in the condition of his herd by keeping them under those conditions. A cow that is giving a good flow of milk does not need very much physical exercise. I would like to have pasture for the young cattle as it is a nice thing for them but pasture is the most expensive feed that a man ever gave to a dairy cow or any other kind of animal because they waste more than one half of it. Of course under present conditions in our country we have not reached that stage in farming where we look at those things as they do in some other places, but the time is coming when we will have a sufficiently large population in this country so there will be very few people that will have any great amount of pasture for dairy cows. If we did not have some rough land that we could not plow, creek bottoms, etc., we would not have any pasture now; but most farmers have some land that is not practical to till and the only way we can get anything out of it is to pasture it, but if it is all level well drained farming land you will make more money by keeping all kinds of stock off it.

Mr. Howard: I am only a plain farmer, as are most of the farmers in Lenawee county. I have been waiting for that illustration of the Rev. Mr. Dedreich as I expected it would come. It seems to me there is a little unfairness in quoting that without telling the circumstances. Of course Mr. Dedreich has done wonderful things, the account of his work reads like a fairy story almost, but the fact that he has done that under conditions that the ordinary farmer in the vicinity of Tecumseh cannot do, so far as receiving the price for his product is concerned, makes it to me a more interesting nature than an instructive matter. As I understand it, he received 25 cents a gallon for his milk, which is practically \$3 per hundred. The farmers around Tecumseh think themselves very favored if they can receive \$1.50 for their milk delivered to a local milk man. Not every farmer has that privilege, but a few have and they consider themselves well favored. Now the question is could Mr. Dedreich have accomplished those things that he did accomplish had he been obliged to send his milk to a creamery and receive creamery prices for it. Of course every cent above the cost of production is profit and every extra cent that we can put on to that profit is excess profit we might say, a profit that means a great deal more. For instances, I do not know what it costs to produce milk but we will say it costs \$1 a hundred. One man received \$1.50 per hundred for his product, another \$2. The man that received \$2 per hundred is getting 100 per cent more profit than the man who received \$1.50. Mr. Dedreich received \$3.00 per hundred for his milk delivered, as I understand it, once or twice a day in one delivery, and he has a great advantage over the ordinary farmer in the way of profit, and while he has done wonder-



ful things I think it is no more than fair, when his example is quoted, that it should also be stated he received an extra profit. What we as farmers want is the example of some farmer under ordinary conditions sending his milk to a factory, or something of that kind, and making a success of his business. The example of Mr. Dedreich is not of as much value to us as the example of someone who is getting the ordinary price for his product. It seems to me that success in any line of business should be estimated on the receipts that a person receives for his business when the product is sold in the open market or is sold in any market in which anyone who produces an equal article is successful. Begin in the dairy business. Success should be counted under just common conditions of sending milk to the factory and not under conditions where an abnormal price is received. I am not saying this as a criticism but simply to bring out the question and to receive instructions.

The Chairman: I think the gentleman is right. That is a good talk and it is along the right line, but I think I have not misrepresented the facts. The question was asked if we could raise the forage on forty acres of land for twenty cows. It does not matter so much about the price received for the product. So far as that is concerned, he did raise the forage on fifteen acres for the thirty-four head of live stock.

Question No. 8. How much milk do you advocate giving calves that you are raising?

The Chairman: When you are vealing calves you should give them all they want twice a day, but do not give them too much skim milk. Skim milk is an unbalanced food and you will make a mistake to overload their stomachs with skim milk. Five or six pounds of feed is all they ought to have, then put in some flaxseed meal jelly to take the place of the butterfat in the milk, but do not try to fatten with skim milk alone.

Question No. 8. Does it pay to feed corn in the stalk to dairy cows? How did Mr. Clement feed his cows?

Mr. Clement: I fed all the clover hay they could eat and shredded cornstalks, two pounds of bran, two pounds of corn meal, and one pound each of cottonseed and oil meal.

The Chairman: I do not think it pays to feed corn in the stalk to dairy cows. If you allow your corn to get ripe, cut it and shock it and draw the shocked corn to feed to dairy cows, I do not think it pays. In the first place, they will not masticate it. Lots of the kernels of corn will pass through the cows undigested. If you cut up your corn when mature and put it in a silo there will be nothing wasted.

Question No. 9. Will Mr. Lillie please describe the best method of tying up cows, that is by stanchion, stall or any other method?

The Chairman: Now, my friends, I will ask to be excused from answering that question because there are no two men in this audience that would agree on the proper way to do it and if we got into a discussion it would be dark before we would get through and no one would be convinced that his way was right. My idea is that if the cow could talk she would say she did not like to be in a stanchion, yet I know the majority of cows are kept in a stanchion. I have come to the conclu-

sion that the Hoard model stall is the best thing I can use. There are probably others just as good.

Mr. Palmer: Don't you think if a cow could talk she would prefer to be untied after she was milked and have a nice covered barnyard at night?

The Chairman: I do not believe, where the temperature is not over 40 degrees in a model stall, that she would care to go out where it was freezing in a covered barnyard. I believe a covered barnyard is a nice thing but not all of us can afford it. I have a good barn with stalls.

Member: I would say a word in regard to the model stalls for the man who feeds his cows in the model stalls twice a day and feeds his cows corn stalks twice a day. We have to pick up those cornstalks and they are the biggest nuisance on earth. I put a model stall in my barn last year. I can see if a man is feeding silage and hay it is one of the nicest things in the world but if you expect to feed whole cornstalks as part of the ration or even shredded cornstalks, you had better leave the model stall out of your barn.

The Chairman: I believe you are right there. One sort of thing demands that you have other things to correspond. A man would be foolish to build a silo and not have a good place to feed his cows. If he is going to feed them in a cold barn he had better feed than dry feed than the moist corn and if you feed whole cornstalks you do not want a model stall. I would not feed whole cornstalks, I graduated from that when I was a boy and I never will go back to them.

The Chairman: The next on the program is an address by Professor Shaw. I want to say by way of preface, if you do not know what Professor Shaw is doing for agriculture in this state up at the Agricultural College, you had better investigate it. Just look him up and see what he is doing. We will now hear from Professor Shaw.

## IMPROVING THE DAIRY HERDS OF THE STATE.

R. S. SHAW, DEAN AND DIRECTOR, AGRICULTURAL COLLEGE.

Mr. Chairman, Ladies and Gentlemen:

While the State of Michigan has a great variety of interests, the live stock business has always been a prominent feature of her agriculture. In a general way mixed farming has been engaged in to quite a large extent during the past, but there are many sections in which the cash crop system was established and has been continued throughout a series of years. Where such a system is followed, providing the use of more or less barnyard manure and a satisfactory rotation of crops is established, lands are likely to soon become depleted of their fertility. Where instances of this kind arise the development of the dairy business is one of the surest ways of restoring and maintaining fertility, owing to the fact that the produce of the farm is usually fed thereon, and also to the fact that almost all the fertilizing constituents of the feed are returned to the soil, as such dairy products as butter remove comparatively little

that could be made use of by the plant. The dairy business also enables a man with limited means to replace a large amount of the capital required in the meat producing business with muscular energy and brains. It is fortunate for the state that stimulating influences are being brought to bear quite generally for the development of the dairy business to which our conditions are so well suited. In a general way the questions of feed and feeding for the dairy animal have been quite fully dealt with, as well as the questions relating to the manufacture of dairy products. There seems to be one phase of the business which requires a serious consideration of the dairymen of the state, namely, the dairy cow. Despite the fact that there are 1,744,510 cattle in Michigan, valued at \$36,374,877, there is serious lack of good breeding and quality in the stocks as ordinary found throughout the country. There are two causes which have tended to produce this lack of quality, one of which has been an indiscriminate admixture of the blood of various breeds, another the lack of introduction of good blood. Aside from a few breeders of purebred live stock, the average herd in possession of the farmer will be found to contain animals varying greatly in quality and also in type from the extreme dairy to extreme beef type, with all gradations between the two. This would seem to indicate that the blood of the several breeds of both beef and dairy kinds have been intermixed. This condition of affairs has arisen in part from a lack of continuity of purpose, or a change from one line of production to another, using first beef sires and then dairy sires, or it may be the result of the intermixture of blood with either one of these two classes. If we are to have any marked improvement so far as the quality of our live stock is concerned, it will be necessary for the dairymen first to make up his mind that he is going to stick to the dairy business, second to decide upon some one breed, and third to use nothing but the best purebred sires that can be procured. It is our judgment that the common bred females can be improved through a system of upgrading by using registered males for generation after generation so that eventually the high grade will equal the purebred from a standpoint of utility in meat or milk making. It would not be possible for all of our dairymen to dispose of their common stocks and procure registered animals only, as the percentage of these is so small that sufficient numbers would not be available. It should be the objective of every man engaged in the cattle breeding business to eventually get into some line of purebred live stock breeding. When the registered male is procured for use in the improvement of the herd of mixed breeding, if one or two females of the same breed are procured at the same time they will soon develop into a nice little herd of registered animals, the owner coming into the business gradually in a safe way, acquiring a knowledge of the adaptability of the breed and other essentials applying to the same.

We have been so firmly convinced that this method of improvement through upgrading is the only practical way of accomplishing the desired end that steps have been taken to establish cooperative breeders associations throughout the state. In December, 1907, a recommendation was submitted to the Michigan State Board of Agriculture, by the Agricultural Department of the College, urging the necessity for immediate action on the part of the college toward the development of

cooperative organizations among the breeders and farmers of the state, designed to stimulate live stock improvement. The recommendation was accepted and adopted, and the department was authorized to undertake the work and put a field agent at work out in the state. This field agent personally visits the various farmers of the community, ascertaining the number of cows owned by them, the breed or combination of breeds of which they are composed, the sires bred to previously, and also endeavors to secure an expression of opinion as to which pure breed they would prefer. When the owners of eighty cows have signified their preference for some one breed the field agent then endeavors to induce the owners of forty more to adopt the same breed, thus securing sufficient for an association of three groups of forty each. A cooperative bull association is then organized, after which three registered sires are procured, one for each group of forty cows. The sires remain in these groups for two years, at the end of which time they are changed around in order to avoid inbreeding. At the end of four years they are changed again so that each individual bull have been used two years in each group at the end of six years. By this method, at a very small initial cost, purebred sires are procured for a period of six years, barring accident or death. According to this system the farmers of the community are being induced to agree upon and use fewer breeds of live stock than have hitherto been found in a given locality. The organizations which have been formed have all incorporated under either Acts 171 or 232 of the Laws of Michigan of 1903. The College furnishes articles of agreement for these incorporated associations. It also furnishes by-laws to govern the cooperative breeding associations. The field agent, who began work about March 1st, 1908, has spent about five months actively engaged in the organization of these associations, as a result 569 herds have been visited containing a total of 4,365 cows, of which 3.75 per cent were registered. Up to the present time ten cooperative incorporated associations have been formed and seven are in process of formation. In addition to this many who have not entered an association have been induced to purchase registered sires. In all 51 registered sires have been known to be purchased, and 2,100 cows that were bred to grade and scrub sires in 1907, will be bred to registered sires in 1908-09 as a result of five month's work of one field agent. The incorporated associations seem to give greatest promise of permanency. Another form or organization in one or two instances has been formed, namely, an association by which a number of breeders have organized with the idea that each individual will procure a registered sire. Still another form of organization in one instance has been established by which the breeders of a given community have pledged themselves not to use anything but registered sires in all their breeding operations. This last plan, however, is not likely to prove satisfactory, owing to the fact that it may lead to a great multiplicity of breeds in the community which will be liable later to lead to admixture of the same. The people of the state are becoming thoroughly aroused to the necessity for improved dairy cattle, and the demands for the field agent in charge to take up the work of organization in different parts of the state is more than the institution is able to take care of at the present time.

## DISCUSSION.

Mr. Palmer: Would you under any conditions, Professor Shaw, raise a calf from a two-year-old heifer if you knew the strain was good?

Prof. Shaw: Yes, the by-laws of these associations require that a heifer shall not be bred to produce a calf at less than twenty-four months. We put that in as a safeguard. I think some of our dairy books have been making a mistake in advocating the breeding of immature females. There might be conditions where it would be wise to produce in less than twenty-four months.

Mr. Palmer: Are the calves as good as from mature heifers, providing a mature sire is used?

Prof. Shaw: Theoretically they would not be; there are three things, you know, in this question of breeding, it is not a question of mating only, it is a question of food and environment and management. All these factors come in and if they are all carefully attended to then I would not object to that cross very seriously. I want to repeat right here one thing that does not come in this line of argument, but I believe it nevertheless. I believe that a great crime has been committed in this state by having the little 18 and 19 months-old heifers producing calves; little bits of spare bodied things, weighing four and five hundred pounds apiece. I have seen so many that I speak freely and with emphasis. I think that is wrong and I want to tell you what I think just at this time,—I think if you take a piston shaft off a 20 horse-power engine and put a ten horse-power shaft in there and set it going, something is going to happen; and so I think when we attempt to force a half ton of butter out of a cow within a period of twelve months that something is going to happen and that we are not going to produce good cows from such extremely forced lines of production.

Another thing, I believe the production of a good cow begins when conception takes place in the female and that the question of nutrition is such an important thing that the future cow's qualities are determined to quite a large extent during that period of pregnancy, and if the cow is turned out to exposure, etc., she is not going to produce as good an animal as if she is taken care of in such a way that all the benefit of nutrition can be absolutely normal. I am not going to talk any more about that. That is one subject that I can quarrel about more than any other one.

The Chairman: Any other questions you desire to ask Prof. Shaw? Here is one question that we did not submit and I will ask you to answer it, Professor. Can alfalfa be successfully grown on rather light sandy soil?

Professor Shaw: If you will tell me what is six feet down from the top of that soil I would feel like venturing an opinion.

Member: It is sand.

Prof. Shaw: I think so. I think so far as alfalfa is concerned, we are just beginning to find out the proper methods of growing alfalfa in the state of Michigan. The business started away down in Mexico, came up the coast and we have been trying western ways of growing alfalfa in Michigan, and they have not been very satisfactory. We are just beginning to find out things about the production of alfalfa and I

would not be at all afraid to try to grow alfalfa on a sandy soil provided you can get it well started. The suggestion I would make is this, if it were light soil I would cultivate it so as to get manure mixed in the top soil. Then I would mix the alfalfa with sawdust, putting it down two inches in the ground.

Member. The difficulty seems to be the top soil dries out for about one inch and below that there is plenty of moisture.

Prof. Shaw: There has been a lot of difficulty in the sandy regions of Michigan because it has been sowed broadcast and harrowed. If you can top dress, sow with grain drill, put down two inches, mix with sawdust or corn meal or something of that sort, and drill it in. If you do not mix it you cannot shut the drill down close enough. I have become quite interested in the alfalfa business and I have been attempting to establish some work along that line to find out all I could about it, because I started it growing in seventy-one different places in the state of Montana where they had no water, and it was one of the most interesting propositions that I ever attempted. I think there are a number of places in Michigan where we can grow it as soon as we find out how to go after it right.

The Chairman: Here is a question that Professor Shaw's address has answered. I think his address here this afternoon has covered this question completely.

Q. What is the best way to breed a dairy herd? Shall we use a purebred sire and breed up, or shall we buy purebred cows or heifers?

The Chairman: Here is another question: Is it possible to keep cows in a sanitary condition without stanchioning or stalling?

The Chairman: I suppose that refers to the covered barnyard. That is quite the modern way of keeping cows. A man has stanchions in which he feeds the sows their ensilage and grain, then he turns the cows into the covered barnyard, in which there are racks in which the roughage for the cows is placed, and tanks of water for them to drink. They are put in the stanchions and stables when they are milked and fed ensilage and grain rations. It is practical to keep the cows that way but of course you have to use very liberal bedding to keep the cows in a sanitary condition.

The Chairman: There is one thing I want to bring up here before we adjourn and that is memberships in the State Dairy Association. We would like to increase our membership in every nook and corner of the state. We know that our strength lies in the numbers of our association and, as you see, we take stenographic reports of everything that is said. These are all put in the annual report of the State Dairymen's Association and we usually publish a report of from 300 to 400 pages. Of course there is some repetition in it but it is very interesting reading to the dairymen. It costs one dollar a year to be a member of the State Dairymen's Association and that entitles you to a copy of the report. If there are any here who would like to become members, Mr. Birdsall will be very glad to take your names and dollars, which he will turn over to the secretary.

There is also one other thing I would like to see, I would like to see a local county dairymen's association organized in Lenawee county. The past year Oceana county organized one and Charlevoix also organ-

ized a county association. We have arranged in our by-laws so that one fee pays for both association, part of that amount going to one association and part to the other, so by joining the local association you become members of both the state and local organization.

I want to invite you all to come up to Grand Rapids the third week in February, 17th, 18th and 19th of February.

Is there anything else to come before this meeting before we adjourned? I want to say to you personally that I have enjoyed coming down here. I like to talk with dairymen; like to get their ideas about farming questions. I assure you that the representatives of the state Association have been very much pleased with the reception that we have received and we feel that we have been benefited by coming down here and we hope to come again sometime.

Mr. Palmer: May I ask just one more question? I believe it is an important one to bring up. I was one of the first in the county that put up a silo and until this year I had a silo and the question I want to ask is don't you believe that as a general thing people put too much corn in the silo. Cannot we raise more fodder to the acre and get just as good results and use protein from some other source to balance up our rations? Do you understand the question?

The Chairman: I think I do. Of course when we raise ensilage corn we take into consideration the food value of the entire plant, not just the ear of corn. I plant corn thicker for ensilage than I would for the ordinary crop but I do not want it too thick so I will not get a good development of the corn plant. If corn is sowed too thick it does not mature properly, it has not the food value in it. I should say that eight or ten quarts to the acre is enough seed to be used for ensilage. You cannot get it so thick that you will exclude the sunshine and still have a good healthy plant, and that is what you are looking for. Three times as much seed for ensilage is enough. Put it far enough apart so you can give it intertillage and allow perfect development of the corn plant, and then you will have good ensilage.

Member: At what stage of maturity do you want that corn?

The Chairman: Just a few days before you would cut it up and shock it if you are going to husk it. The majority of it is nicely glazed and beginning to dent. That is about the right condition for it to go in. It ought to contain enough moisture so it will properly preserve in the silo.

Anything further? If there is nothing further to come before this meeting, we will now stand adjourned.





---

PROCEEDINGS OF THE  
THIRTEENTH AUXILIARY MEETING  
OF THE  
MICHIGAN DAIRYMEN'S ASSOCIATION  
HELD AT  
SALEM, MICHIGAN, JANUARY 15-16, 1909.

---



The thirteenth auxiliary meeting of the Michigan Dairymen's Ass'n was opened at the Congregational church at Salem, Washtenaw county, Friday, January 15, 1909, with President Colon C. Lillie in the Chair.

The meeting was called to order at 1:30 o'clock by the Chairman and opened with a prayer by the Rev. Mr. Bettys.

### PRAYER.

Let us ask the Divine blessing. Almighty God, the Maker, the Father of our spirits, bless us with infinite blessing. Thou hast given us a grand country, a noble heritage which has been left us from our fathers and they wrested it from the hand of the enemy by heroic effort. Thou hast given us its mountains, its valleys, its lakes, Thou has given us all those things for which we ought to be grateful. It should call from our hearts the deepest gratitude. Thou hast enriched the land with great things. We thank Thee for the riches that are, riches in the soil and down in the body of the earth from all sources and of all kinds. Thou hast blessed us with great things.

We ask Thy blessing now upon this gathering this afternoon. May we not forget Thee, Oh God; may our right hand forget its cunning, may our tongues cleave to the roofs of our mouths if we do not esteem Thee above all these other things. Accept our thanks and praise and gratitude through Jesus Christ, our Lord, Amen.

The Chairman: We have observed the custom of having an address of welcome at the Dairymen's Association meetings. This is a custom kept in vogue at our state meetings and we have carried it along at these auxiliary meetings believing it is a good thing to get the town people in touch with the country people because we meet in the towns, we necessarily have to do so. It is a sort of opening between the two classes of people. I believe there ought to be more friendly relations, if possible, between the farmers and the town people, so I think that this custom of preserving this welcome address is a very good thing indeed. Mr. Fred Wheeler of this place is to give the address of welcome at this time.

## ADDRESS OF WELCOME.

MR. FRED WHEELER, SALEM.

Mr. President, Members of the State Dairymen's Association, Ladies and Gentlemen:

It gives me great pleasure to welcome to this village and township the 13th auxiliary convention of the State Dairymen's Association.

We have not many points of interest for you to visit during the rest periods of the convention, but as winter is a poor time to see the beauty spots of a city and as you are not here for that purpose, we can only present you with the keys of the town, inform the police of your presence and wish you a good time.

We think we have one of the best dairy townships in the state, producing at the present time a large quantity of high test milk for the bulk of which we have a good outlet in the Detroit Creamery Co. and the Worden Creamery Co., which last named company was fostered in its early days by our honored townsman, John Munn, a man whom we are all proud to see holding one of the responsible positions in the State Dairy and Food Department.

We feel highly honored that the state Association has seen fit to call one of their few state meetings in our town.

We are glad of the opportunity to meet with the President of this Association, the state representatives and the milk producers of other localities and in the exchange of ideas we are bound to improve our conditions, which is a step in the direction of successful farming.

The farmer a short time ago was looked down upon as the underdog; but now, thanks to his progressiveness and to a great civic enlightenment, he has become a most necessary element in the development of the country.

The old idea that the farmers are indifferent to education has been shattered by these repeated visits of agricultural educators and the readiness with which the farmers adopt the methods taught by these scientific men.

The eagerness with which they seek literature pertaining to their problems and the questions propounded by them show that they are alive to the situation.

Sentiment has changed greatly toward agricultural education in the last few years and it has been brought about mainly by these meetings of the dairymen's and farmer's club associations.

They now realize that their main need is not simply to know how to sow and reap but to understand all the underlying principles in farm cultivation.

As the farmers get the habit of scientific farming, each one will become, according to his ability, an investigator, discovering new and better methods than even the specialists now know.

It is evident that a widespread appreciation of agricultural educa-

tion is developing, and that public sentiment is changing from one of prejudice to a firm belief in the benefits derived therefrom.

The practices of our forefathers are giving way to new and progressive ideas.

This end, so desirable and so fraught with possibilities to the future of the nation, can only be attained by agricultural education and when it is attained, there will be an amazing conservation and development of the untouched resources of the soil.

The successful raising of cattle and the increased production of milk, thereby returning to the soil nearly all the products of the farm, is one of the main attributes to successful farming and the methods of attaining which I understand is one of the objects of this Association.

Again I welcome you to our town and express to you my desire that you may have a successful and interesting meeting and that we may all be benefited thereby.

The Chairman: We usually put down the secretary of the state association to respond to the address of welcome. We did so on this occasion but Mr. Wilson wrote me that it was impossible for him to attend this meeting. He had other things to attend to and as he had the last thing to say about the program he put me down to respond to the address of welcome.

I assure you that the State association is very glad of the opportunity to come to Salem, we were very glad to receive the invitation to come here. I want to congratulate Mr. Wheeler upon his welcoming address. It is not often that we have the pleasure of listening to as good a one as that which he has just delivered here. We are glad to come to Salem because we like to go where people are interested in the business of dairying. Sometimes we go to sections where dairying is not developed very much and we never have as good a time. We cannot tell whether we do as much good in those localities but we know when we come to an old dairy section like Salem that we are going to have an interesting meeting because we know there are people here who will take part in the discussions and not only make the meeting interesting but profitable.

Now we have not come here with the idea that we can give you a whole lot of information that you do not already possess. We realize you have as good an opportunity to get information about dairying as we have. We have not that idea at all but we are in hopes that this meeting here will arouse a greater interest in the subject. Mr. Wheeler hit the nail right on the head when he said that we wanted to arouse an interest so we will have an investigation of things. That is all we can hope to do and if we can accomplish that then we will have accomplished a great thing; if we can arouse enthusiasm sufficiently so you will investigate this subject of dairying, give it a little more thought and attention than you are now, you will be better dairymen, you will be better citizens and you will make more profit out of the business.

I again assure you that the pleasure is largely on our side in this coming to Salem.

## A CO-OPERATIVE COW TESTING ASSOCIATION FOR SALEM.

Had I known just how it was going to be, I would have changed the order of the program just a little, but perhaps I might as well say what I have to say now rather than later on.

This subject of a cow testing association for Salem came about because when I was here last fourth of July several of the leading dairymen seemed to be interested in a co-operative cow testing association. I put it down early on the program because I wanted it discussed all through this meeting. I believe one of the most important things in dairying at the present time is the co-operative cow testing associations, and I would like to see interest enough aroused at this meeting in this vicinity so that you would organize a cow testing association.

Is there a need of it? My friends, there is a need of it in every dairy community in this state. What we want in dairying and in agriculture is to put our business on a business basis, to know what we are doing. That is the greatest trouble with agriculture to day, we farmers do not know what we are doing from a business standpoint. Enough of us do not know whether there is money in sugar beets or not. We raise them because somebody else raises them. We do not keep strict account of all expense, the effect of rotation of crops, the cost of raising them, the effect on the fertility of the soil—we do not sufficiently take those things into consideration to put our work on a business basis. The same may be said of all the staple crops that are grown; we grow them because everybody else grows them, because we have to do something, but we do not keep a strict enough account of the business to put it on a business basis, like the manufacturer or people engaged in other lines of business. That is one trouble with farming today, and particularly that is true of dairying. A man has a herd of cows, he raises the bulky part of the ration he feeds them, puts in his time raising those crops, stores them in his barn, and feeds them to his cows; he milks those cows and sells the product. He knows of course that he is making something out of dairying. We can appreciate that. I do not believe so many people would be engaged in dairying, year after year, unless they realized beyond the question of a doubt that there was profit in it, but I do believe that there is only now and then one that has put this business of dairying on a business basis so he can tell just how much he makes, and put it on a basis so that he can figure in the future to make more out of it than he is making now.

The greatest chance for improvement in dairying is to improve the dairy cow, the greatest capacity of economical production of the dairy cow, because there is a great difference in dairy cows, more than a great many of us realize if we have not investigated the subject carefully, and when we do we find cows standing side by side in the same stable, that we are giving the same feed and the same care, and one will be producing two or three times as much profit as the other. We have been studying the herd but we have not been studying the individuality of the herd. There is a chance, of course, for making improvement in simply

studying the herd as a whole, but we know in a general way how we figure our herd of cows. We can figure how many tons of hay we put up this year, how much corn we have fed them, how much grain we bought for the whole herd, and we know how much we received from the whole herd so we can tell in a comparatively easy way whether we are making any profit out of our herd or not; but we cannot tell how many cows in that herd brought us a profit and how many brought a loss. When we investigate we find we have an exceptionally good herd if we do not find quite a number in the herd that are not producing a profit, there is so much difference in the individuality of the cow. If we stop to think about it, we would naturally expect a great difference in the individuality of the cow because we see a difference in the individuality of everything else. We know that one horse is not worth \$50 to have on our farms while another horse is worth \$200 to work out on our farms and yet there is not that difference in the looks of them, but one has endurance, one does not take as much feed for the energy expended as the other. You can tell that with a horse, of course, without very much investigation but when it comes to dairy cows too many men seem to think that all dairy cows are alike and they do not like to pay any other than the same price for them. I have heard farmers say they would not pay over \$35 for a dairy cow, that was the limit. Some cows are not worth \$35 and some cows are worth \$150 and \$200 as a business investment, there is that much difference in cows. Some cows are worth even more than that. There is many and many a cow worth \$200 or \$250 as a business investment and there is many and many a cow that is not worth anything as a business investment as a dairy cow, in other words they will not bring in a profit; they have not capacity enough to consume the feed which we grow on our farms and manufacture it into milk at a profit. How much is such a cow worth? She is worth just what the butcher will pay for her, that is all. She has a food value there in her carcass but as a machine for the dairyman to make money with she is worthless and worse than worthless. Have you any of these cows in your herd? If you have not kept strict account with each individual in the herd you do not know.

Even if you feed the cows yourself and milk them yourself, you cannot tell by that alone. You have got to know how much milk a cow gives in a year, what the value of that milk as a food product is and how much it costs to feed that cow in a year before you can tell whether your cows are profitable or not. Now it is not so very much of a task for the farmer to find out these things. He can weigh the milk, test it occasionally for butterfat because that is the great factor for determining the value of milk, whether it is made into butter, or made into cheese, or sold in the city of Detroit, its value is measured largely by the per cent butterfat it contains. Then he can keep track of how much it costs to feed that cow. Some farmers do this but their number is small. I do not know why it is—but yet I do know why, it is because the farmer is a busy man, he has a great deal to do, and this is always extra work. He will perhaps form a good resolution, like the New Year's resolutions of a good many people, and say "I am going to investigate the individuality of my herd of cows this year." He will start out and do it until the Spring work commences, when there will be lots to do. he will be working very hard, his hours will be so long that he will

think it will not make any difference if he does not do that extra work until tomorrow, and he will keep putting it off, and finally give it up entirely. I know something of that by experience and something by observation because I have had people tell me they had formed this resolution and intended to carry it through but in some way or other did not carry it out.

This work can be done on your farm by yourself if you will do it. It costs you nothing but your time, but you will not do it. You do not do it. Now then, the co-operative cow testing association is just simply a local organization of dairymen for the purpose of testing these cows. Instead of each man on his own farm attempting to do this for himself, you organize or co-operate, and hire a man to go from farm to farm to do this work for you. That plan has been found to be very satisfactory. If you take your time into consideration, it is a cheaper way to test the cows than it is to do it yourself. We will look at it from another standpoint, it is more liable to be of value than if you had done it yourself, because it has to be a pretty good man, if he is testing his own cows, that does not give the cow the benefit of the doubt; he will make her out just a little bit better than she really is; he will give her a little more favorable record than she actually makes, if it is possible to do so without doing too much in that direction. That is only human nature. The old saying is that a man is foolish to cheat himself and yet when a man comes to test his own cows it is as big a temptation to cheat himself as any proposition I ever saw, because we like to have our cows do a little better than our neighbors' if we possibly can. We are liable to read the tests as high as our conscience will allow us to do; we are liable to figure the ration as low as possible to make out a good case for our cow. A more satisfactory record of those cows, one more valuable to the farmer, will be made by a disinterested party who goes from farm to farm.

This co-operative cow testing association simply puts dairying on a business basis. We know with it exactly what we are doing, we know what each cow is capable of doing every year. The state dairy and food department became very much interested in this idea. They did not originate it; it is copied almost entirely from the dairy co-operative association of Denmark, Norway and Sweden and Germany, those intensely dairy districts of the Old World. Those associations have been in existence there for a number of years and are gradually increasing in number all the time. This state became interested in the subject because the Dairy and Food Department had an inspector who had grown up with those associations and understood them, a young Dane, Mr. Helmer Rabild, who had been identified with dairy work in Denmark, had charge of a cow testing association, his father was a Danish dairy farmer and had been a member of the co-operative cow testing association, so Mr. Rabild understood the matter from beginning to end. He had had practical experience so he knew the value of these associations and this system of testing cows. He had seen the actual improvement made in developing dairy herds in Denmark through that system. We became enthusiastic through his talking about those things and attempted to introduce some of that work in the state of Michigan.

Nearly three years ago we succeeded in organizing the first cow testing association not only in Michigan but in America over here in



Newaygo county, at Fremont. At a dairy meeting like this, the subject was briefly explained and some of the leading dairymen there became very much interested in the proposition. They could see there was certainly a chance to make an improvement, a chance for the dairyman to know exactly what he was doing. A short time after that they wrote the Department and asked for some assistance. We sent Mr. Rabild up there and he succeeded in organizing that association. Mr. Rabild was more pleased over his work than were the people up there. I never saw a young man so pleased over anything he had accomplished as Mr. Rabild was in organizing this first co-operative cow testing association in America. I remember I was going up to a dairy meeting at Birch Run. As I walked off the train the station agent came to me and asked if my name was Lillie, and when I said it was he said "There is a telegram here for you" and he handed me a telegram. I opened it, it was from Mr. Rabild. He felt very good over the fact he had succeeded in organizing this cow testing association, so he could not refrain from wiring me at once "The first cow testing association in America was organized last night in Fremont. Banzai." This was during the time of the Japanese war and their word was in everybody's mouth. It means "Hurrah."

I have with me here the report of that first co-operative cow testing association. I presume you people have seen this bulletin. The State Department published thirty thousand of them and sent them all over the state. Here is a picture of the first cow tester in America where he is testing the milk in a man's kitchen. This tester simply goes to a man's farm, stays there over night; he sees the milking done, sees the feeding done and weighs the feed that each cow is given as a ration. The next morning he does the same thing. Then he tests this milk, figures out the yield of butterfat and he charges the cow with the ration she consumes. Then he goes to the next farm. First, however, he leaves a record with the farmer so that every farmer knows what he is doing. The first farmer takes him and his tester to the next farmer, where he repeats the same process, and then he is taken by that farmer to the next farm. At the end of the year he makes out a statement for the entire year, so that each member of the association knows how many pounds of butterfat each cow in his herd produces, how much it costs to produce that for each cow, and then the average for the whole. In that way a man learns something about his herd that he never knew before. Mr. Henry Rozema, of Fremont, one of the best dairymen you could find in any community, a good practical dairyman, told me that he had two cows that he intended to sell. He did not like them, they did not look right to him; but they organized this testing association there and he thought he would put them in, and at the end of the year he found those two cows he was going to get rid of were the two most profitable cows in his herd. He did not like them because they did not look just right they were rather thin, and his ideal cow was a nice sleek looking cow; he admired that kind of animal and wanted to get rid of those because they did not fill the picture in his mind's eye. But when those cows were tested he found they were two of the best cows in the herd and he did not sell them.

We have had the report of all the cows in that association, giving the cost of the ration and production of butterfat, and, by the way, the

price of the butterfat was just the wholesale price received by those patrons at the creamery there. It was not a fancy price or assumed price, it was the actual value of the butterfat to them. They received that much out of it because it was made into butter and sold on that basis.

I cannot call your attention to every herd here but there are one or two I want to call your attention to just to bring out an idea. For instance, here is Herd A. The herds are designated by the letters of the alphabet and the individual cows are numbered. Herd A has nine cows, mixed breeds, just native stock. They were fed a ration of timothy hay, oat straw, carrots, corn stalks and pasture, corn meal and corn and cob meal, cottonseed meal and ground oats. This record was taken three years ago and the value of feed would differ a little from now, but at that time timothy hay was figured at \$5 fed in the barn, oats at \$3 a ton, carrots \$12, cornstalks \$3.50 a ton, average price of cottonseed meal \$20, corn meal \$20, pasture for May \$1.50, June, July, August and September \$2, October \$1.20 (in October the cows did not get a full ration from the pasture and were fed a supplementary ration which was charged in, so they did not allow quite so much for pasture). The yield of milk is all figured out. You understand that this was just an ordinary dairy neighborhood up there, you could find better in the state of Michigan, and the dairymen did not make any preparation for this test, they simply put in the cows that they had and the feeds they would have given their cows if they did not belong to the association, only some of them, after they got started, changed their rations somewhat, but it is simply the average conditions in an average neighborhood. Some of the cows in Herd A were not in for the full time but they were all averaged; the number of pounds of milk on the average per cow was only 3,349 pounds, the average per cent of butterfat was 4.08, the cows only averaged 137 pounds of butterfat during the year. Those were pretty poor cows, their owner was a poor feeder. It only cost him \$18.88 to keep a cow a year; he received on an average \$1.64 for every dollar's worth of feed which he fed them. One cow in his herd returned him \$2.20 for every dollar's worth of feed which he gave her and one cow in his herd returned him 54 cents for a dollar's worth of feed. Now the more cows that a man will have that will return \$2.20 for a dollar's worth of feed the better off he is and the more cows a man has that returns 54 cents for a dollar's worth of feed the worse off he is, and he cannot tell whether his cows are doing one or the other until he tests them; he cannot tell by the looks of the cows any more than he can by the looks of anything else. You cannot tell by the looks of men or women whether they are good for anything or not. If we picked out women on their looks we would be much dissatisfied sometimes.

Herd B had twelve cows in the herd. Those cows on the average gave 5,773 pounds of milk that tested 3.91 per cent; it cost this man to feed his cow, on the average, \$30.08—a different kind of farmer, don't you see. He received on the average \$1.71 for a dollar's worth of feed; his best cow returned him \$2.29 for every dollar's worth of feed but his poorest cow returned him 52 cents for a dollar's worth of feed. The rest of them ran between the 52 cents and the \$2.29. Here is another cow that returned \$2.22, and another \$2.01, then it runs down to \$1.50. I do not want to tire you with figures but I want to show you what you

might expect to find in your dairy herd if you have not investigated it. If you do such a thing, you will find out that you do not know much about cows after all, when you come to investigate them.

For the sake of another purpose, as well at this, I will just give the final summary of the 229 cows in this test association, owned by 39 men. On the average those cows produced 5,336 pounds of milk, average test 4.04 per cent, average production of butterfat was 215 pounds, average value of the butterfat was \$50.27. That is not very bad for a whole community, to have them receive \$50.27 per cow. If you have read the dairy cow investigation in Hoard's Dairyman for the last several years you will find out that we have better dairymen in Michigan than there are in some other states, because they did not begin to get \$50.27 per cow on the average. On the average the men received over \$1.72 for a dollar's worth of feed and they produced butterfat at 13.6 cents per pound.

Some people will attempt to tell you there is no profit in dairying, that we are going through all this labor in dairying for nothing, that there is no profit in it when you take into consideration the expense of labor, but I tell you when ordinary dairy farmers in an ordinary community with ordinary cows can get \$1.72 for every dollar's worth of feed which they give their cows there is some profit in it. They might better sell their cornstalks to their cows on their own farm for \$3.50 per ton than to draw them off the farm. It is the same way with the hay, the same way with anything. In most cases they charged the cows with ensilage at \$3.50 per ton. It is better to sell that corn to your own dairy cows on your own farm and make a profit out of it than it would be to sell the corn off the farm. People who are raising timothy hay and selling it off their farms for from \$5 to \$8 per ton might better sell it to their dairy cows for that price and make 72 per cent profit, because they are not only patronizing the best market (the dairy cow) on their own farm and making their profit from using the market, but they are simply saving the fertility of their farms because every ton of hay, every ton of any crop that you grow on the farm and sell off the farm takes from the farm a certain amount of plant food, viz. phosphoric acid and potash and if you get it back you have to buy it back; but not only that, my friends, it is also taking off the farm almost the entire amount of vegetable matter which those crops contain and there is many a farm in the state of Michigan today that is not producing profitable crops, more from the fact that the land has been robbed of its vegetable matter than because it has been robbed of too much plant food. In other words, our fields have gotten into a poor mechanical condition, which is one of the principal reasons we do not grow as good crops as we formerly did, rather than from the fact that they are depleted in fertility. Now when you feed the crops on the farm you save all the vegetable matter or the organic matter that is in the feed and that can be put back into the soil to keep it in good mechanical condition and when you reduce the soil of its vegetable matter or humus you have destroyed the crop producing power of the soil. That is one thing, it seems to me, that ought to be talked at a dairy meeting as much as anything else. To illustrate a little further on that point. You take a field in this community that has been kept in good shape and it will grow all sorts of crops luxuriantly; it will grow big corn, nice

clover, good wheat, oats, or anything. Right by the side of that field in the public highway you can raise nothing. Take a cubic foot of soil out of that fertile field and a cubic foot of soil out of the public highway, send them both to Lansing, either to the state analyst or the chemist at the state experiment station, and get an analyses of them. The analyst may find as much or more nitrogen, phosphoric acid and potash in the soil taken from the road as from the field, and yet one will not grow crops at all and the other produce them luxuriantly. What is the reason? One is a living soil, full of growing organisms, full of vegetable matter, which makes it in splendid mechanical condition fit for and congenial to the growth of plants; the other contains plant food but it lacks this thing, it is a dead soil does not have living organisms and does not contain vegetable matter. So when those people are selling their hay at the market price to the cow, if they only get the same value for it as if they sold it off the farm, they are making a good per cent on their investment by keeping up the crop producing power of their farm. Perhaps that is getting off from cow testing associations a little but it is something we ought to talk at dairy meetings just the same.

Now as to a cooperative cow testing association in this vicinity. I believe nothing could be done which would so stimulate the building up of more productive herds than the cooperative cow testing association. When we see things in cold figures and facts we believe them. When we hear people talking about them, many times we take those same facts and figures with a good deal of suspicion, but when we have had actual experience in our own herds with those things then we cannot help but believe them.

How much does it cost? These associations are organized on the same plan and the expenses of the cow tester are paid on the same plan as we used to pay the district school teachers, everyone pays pro-rata. The old district school teacher received a certain amount per scholar, the man sending five pupils paid five times as much as the man who sent one. We have outgrown that system in the schools but it seems to the fairest way to pay in the cow testing association. You have to pay a man for testing your cows somewhere in the neighborhood of \$350 and board him. He boards at your house when he is testing for you, you take him to the next farmer's house and he boards there until he is through there. If you can get 350 cows in twenty-six herds, because there are only 26 working days in a month, then it will cost you \$1.00 a cow. If you have less than that number of cows it will cost each man more per cow. I think if you had more cows than that you would be satisfied to guarantee the tester \$350 and give him all he made over that. That is the basis upon which we have organized these associations in this state.

The first year in our cow testing association at Coopersville we guaranteed the man \$300. He earned a little more than that, but not much. Last year the arrangement was about the same, but this year he has all the cows he can test. More people want to come into our association than he can handle. A man can test 500 cows if he has them in 26 herds. Of course where two men live across the road from each other and have small herds, he could handle them both at once and put them together. The work of cooperative cow testing is not arduous. The tester does not have to work very hard and yet he has to be care-

ful in figuring. He ought to know a good deal about dairying, he ought to know enough so the members of the association could talk with him and get some ideas about feeding, how to change a ration. One man in our neighborhood said that this year he had saved enough in his ration to pay for testing his cows for ten years. His idea was gross production, he thought if he could feed his cows so they gave a wonderfully big flow of milk he was making money. When his cows were tested and it was shown him how much it was costing to feed his cows, he knew he had to make a change, and he said he made enough on this change of ration alone to pay for testing his cows for the next ten years.

I do not know that it is necessary for me to say very much more on this subject at the present time. I want to have it discussed and would be glad to answer any question that I can. I am positively sure that if you have enough dairymen here who have herds large enough so it would warrant the organization of a cow testing association, that you would be much pleased with it. I believe it would be greatly to your benefit.

Now you see there is something besides just the dollars and cents in the production of milk involved here. Dairymen must raise their own cows, they cannot buy good cows. You have to produce them on your own farms. Supposing you have a cow in your herd that is bringing you fifty cents for a dollar's worth of feed. If you knew that would you like to raise a heifer calf from that cow to keep in your herd? I would a great deal rather have a calf from a cow that gave me \$2.20 for a dollar's worth of feed than from the cow that gave fifty cents for a dollar's worth of feed. So it is the basis of improvement in dairying. It is said that in Denmark, since this system of cow testing has been in vogue, the net proceeds for the whole kingdom have been increased 75 per cent, and that in numerous individual instances the net profits in dairying have been increased over 100 per cent. Denmark is a little kingdom, about one-quarter the size of the state of Michigan, yet today Denmark has over four hundred cooperative cow testing associations and Michigan has four. If we had them in the same proportion that they have them in Denmark we would be entitled to about 1,300 cooperative cow testing associations, and if we had that many we would not have to talk of them at dairy meetings, we would know about them. I thank you all for your attention.

The discussion of this topic is to be led by Mr. Clayton Deake.

## DISCUSSION.

MR. CLAYTON DEAKE, SALEM.

Mr. Chairman, Ladies and Gentlemen:

Mr. Lillie said in the beginning that he was responsible for this program so you see why it is that I am down here to talk to you. Had it been made up by the people here at Salem, I assure you I would not be on the program to talk today. I can say, however, that I am very much interested in this cow testing association. I first heard of it when

they organized the association at Freemont and I have heard considerable regarding it since, so that I feel sure if the people of Salem would organize in such an association it would be of great benefit to us.

Mr. Little has given us the comparison of the first two herds. You will notice there was but little difference in the income the owner received, but the first man fed his cows at a cost of \$1.87 and the second man fed his cows at a cost of \$30 per cow. You can see he was building up his soil in just that greater proportion, while the first man who fed at a cost of \$18 per cow was feeding a poor ration and not benefitting the soil. The second man received just as much profit in dollars and cents and at the same time was building up the soil fertility a great deal faster, so there was a benefit there of which Mr. Lillie did not speak.

(Mr. Lillie: He received nearly 10 per cent more profit.)

I am sure if we would enter into this testing proposition we would be greatly benefited by it. There was one thing I had hoped Mr. Lillie would bring out but he did not, that is whether with the comparison from month to month those farmers took more interest in their work which I am sure they did. In reading of it, I found in the latter part of the year, when they became more interested in this Association, that their cows were bringing them in a larger percentage, and I am sure that would be a benefit to us here. As we became interested in the matter we would take more care of our cows and they would soon begin to bring us in a larger income.

I think that is all I have to say to you and I am sure there are others here we would be glad to hear from.

The Chairman: Another thing, this Association has increased the interest in dairying to such an extent up there that, although when the association was organized there was not a registered dairy sire in that community, today there are twenty-two registered dairy sires up there, which simply shows it has aroused interest there. The farmers up there believe in better cows and they believe the only way to get them is to breed them themselves and they are beginning to do that, and you will see that sometime there is going to be a wonderful dairy community in Newaygo county. The interest in dairying started when they started to investigate this cooperative cow testing association.

Mr. Cole: Would the test we receive for our milk or cream through the test association agree with the test we received at the creamery or from a dealer if we were selling whole milk or cream?

Mr. Lillie: The average of the individuals in the herd would not agree with the herd test at the creamery, because the cow that gives the smallest percent of butterfat almost invariably gives the largest mess of milk. When you mix that with the other milk, you see your herd test would be a little more than the lowest cow's test and not as high as the highest test. In order to have that percentage you would have to multiply the number of pounds of milk each cow gave by the test, but there is one thing certain and that is there would be very few objections to the test by members of the cow testing association because they find cows vary in the amount of butterfat they put in their milk from day to day, so they see the creamery man does not always make a mistake when good cows do not test one day the same as another.

Mr. Cole: How often does this man test the milk?

The Chairman: Once every month, that is all he can do unless you pay him more and have only thirteen herds in the association; in which case he can test them every two weeks. A man has to have a certain amount of wages to live. Now then, on this thought one would get the idea that that would not be often enough to have anything accurate and yet that has been very carefully figured out by the Danish government and they know beyond the question of a doubt that it is almost absolutely correct. You take the actual milk which a cow gives in twelve months, weigh it every milking, then take those records one day in a month for estimation, two weeks back and two weeks ahead, figure up the average and you will find it comes out within 4 per cent of the cows in the association in the whole kingdom of Denmark. The Dairy Division of the Department of Agriculture of the United States has recently become interested in this cooperative cow testing work and they have taken Mr. Rabild away from the Dairy and Food Department of Michigan. He is now connected with the Dairy Division of the Department of Agriculture in this cow testing work, and he was sent by the department over to the Minnesota College of Agriculture to investigate this very same question. Over there Professor Haecker has the records of his cows for the last twelve years. He is the only man in this country that has those records. He knows what every cow has given every milking and knows what that milk tested at every milking for the last twelve years in the college herd. Mr. Rabild went there and spent time enough to investigate those records thoroughly. He took say the 15th of each month the amount of milk each cow gave and the percentage of butterfat in that milk on those days, figuring it out to correspond with the actual number and he found out in numerous instances where the average only varied a few pounds of butterfat in the whole twelve years. At first it would hardly look reasonable that that would be the case and yet we know that in normal conditions a cow gives about the same yield of milk. It varies somewhat but not very much. She should gradually fall off in her milk from natural causes until she becomes dry, but there is not much variation in that and it is safe to figure in that respect for all practical purposes. While we know it is not absolutely correct, yet when we get it within 4 per cent it is close enough, and in many instances Mr. Rabild found from the Minnesota records that it was closer than that in longer periods. I satisfied myself on this question in testing my own cows, by taking the records of the Columbia exposition at Chicago where they weighed the milk and tested it every milking during their test of 120 days. I did not weigh the milk of my cows but one day in the week instead of weighing it every day. I took a certain day in each week what those cows gave in that test and multiplied it by seven to get the number of pounds they gave in a week, and you would be surprised to see how close it came to the actual number of pounds. I figured out two or three from the actual test at Chicago and for the whole 120 days the average varied only 2 per cent, by taking one day each week and figuring each week that way for the whole 120 day and comparing that average with the actual number of pounds of milk the cows gave.

Member: The tester must assume that the farmer weighs his milk every morning.

The Chairman: The tester does not take the farmer's weights, he takes his own and estimates the total weight. As I have been trying to tell you, this is accurate enough for this investigation.

Member: Is it necessary for the dairymen to take samples for several days in order to get a composite test?

The Chairman: No, the tester takes the samples night's and morning's milk in the twelve days, and you can see that is all he can do.

Mr. Munn: Is not the man doing the testing supposed to tell the farmer what he should feed his individual cows?

The Chairman: This man is a hired man and supposed to do his own business and attend to it, but he is not supposed to go around and tell the farmer how to do his business.

Mr. Munn: I thought it was part of his duties to tell the farmer how to feed a more economical ration.

The Chairman: It is his duty if he is asked but it is not his duty to assume he can tell a man how to run his business. If the farmer asks for information then he will get it.

Mr. Munn: I think it would be worth more if he were able to give that information because many farmers are not able to feed intelligently.

The Chairman: He certainly would but I do not want a man to come to my farm assuming at the beginning that he knows more than I do. I know pretty nearly what I will feed my cows and want to know what results I will get from them. If the results do not come out right I might want to talk to him, but if we start a man out with the idea that he has to go around among a bunch of farmers and tell them what they ought to do, he will wish he had not started. Don't you believe that?

Mr. Munn: If a farmer thinks you can make him more money he will fall in line pretty fast. If he can give me a better ration I am willing to listen to him.

Member: You would advise him to be capable of that?

The Chairman: Certainly I would.

Mr. Munn: Well if he is educated along that line he can tell two-thirds of the farmers something.

The Chairman: I am not going to assume that, you can ask him if you wish. I illustrated that by telling what a member of our testing association said he saved by following the advice of the cow tester on his ration, he saved enough in one year to pay for testing his cows ten years. But if you hire a man with the understanding that he tell you just what to feed there will be trouble.

Mr. Munn: I do not mean to say he will tell us what we have to do but what we could do and make money.

Member: Would it not be possible for the tester to give a herd test to each member of the association?

The Chairman: Yes, he figures that out every year. He will give you the average test.

Member: It will do away with the dissatisfaction between the creamery and the farmer.

The Chairman: Yes it will do that for you.

Member: Would it not be hard to find a man in a community that would fill the requirements of a good cow tester?



The Chairman: Yes, it is. We have been fortunate so far in getting old country people who have had experience along that line and they have been very helpful to a number of the farmers. The greatest hindrance is they cannot talk English very well; they have to learn that first but they are thorough dairymen because they are bred up in this work. They know what they feed in the old country and in addition they are helpful to us. So far we have found men that were capable of doing that. The young man that is operating our cow testing association is a Dane, came to this country a year ago and could scarcely talk English. He is getting now so we can understand him very well and he has good ideas about feeding cows. He has been quite helpful to many of us in that respect and he is cautioning us all the time not to feed too expensive a ration. You do not have to caution the average man not to feed too much but when you get into a cow testing association you are liable to want to make a big record and feed a more expensive ration than you should, yet what we ought to try to do is to make the greatest profit. That is what we are in the business for. You know the Danish people are practical, they have to make a profit if they pay expenses over there. Their land is worth from \$200 to \$1,000 an acre and they pay high rent, and they have to make some profit, they have to feed closely. The trouble in Michigan and America is the farmers are not hard up enough to do real good farming, they have not yet had to figure very closely. We waste more in this country, twice as much as we ought, we waste more than the Dane's receive in profit and yet they can live on that high priced land, pay those high rents and high taxes because they can figure everything and know just exactly what they are doing. If we did that the farmers in this country could wear diamonds if they wanted to.

Member: It seems as though a man capable of doing that work could command more than \$350 a year. That is pretty small wages for a man that would know what we demand of this cow tester.

The Chairman: Well \$350 a year and board is as good as \$50 a month. It is better than a job in a creamery at \$50 a month, and a Dane coming over here, not understanding the language, cannot get just the work he wants. They are working in the cities at common labor and then do not get work half the time. I think it would be a pretty decent sort of job for a foreigner to come over here and live in a good farm home and receive \$350 a year clear.

Member: Yes, but can you get danes every time you want them?

The Chairman: No, not necessarily. Raise a tester in your own community. Over in Fremont the tester is a young man of that community, a farmer's son. He learned how to do the work and he does it. After you get started on this ration, a man has not got to be able to tell exactly what ration he ought to feed his cows, but you want to know how it comes out and you do not know unless you keep a record of it. It is not necessary that a man be a college professor to do this work. A good young fellow would be better than a college professor, who might talk too much, argue too much and think he knew too much about the matter. The best way to do the work is to show the results you are getting and the gray matter you have in your heads. You will do some figuring yourselves.

Mr. Munn: Would this work take the entire time of a man? I did not know but if he had a small farm he could do the work and attend to his farm besides.

The Chairman: You see he has to be in a different place every night but the cow tester has lots of time. He goes out and works perhaps a half a day with the farmer for exercise. This Dane we have will walk five miles and back every evening for exercise, but he cannot have any other job because he has to be there. However, it is not hard work.

Member: Could we tell anything about the records of the cow by testing the milk in glass tumblers?

The Chairman: Yes, you could tell something but not much. The trouble is the cream will not all raise, but when you test your milk with the Babcock tester you get every bit of fat there is in it. You know no two creams are alike. The fat globules in one cow's milk come up readily and you get all the cream while in another cow's milk it does not, so you cannot tell so very much about the cows testing in glass tubes or tumblers.

Member: I suppose that the short dairy course at the Agricultural College would fit a young man for this work?

The Chairman: It would help him very much.

Member: Would taking such a course make him capable?

The Chairman: It would fit the right kind of young man almost perfectly for it, but there is such a great deal of difference in young fellows the same as there is in dairy cows, that you cannot tell much about them. Now this being able to tell the farmer just what to feed does not amount to so much as you think it does. The record, showing exactly what each cow does, is the important thing, and then the farmer's gray matter will begin to work for itself when he sees that record and he can get information about rations almost anywhere, and when he reads a ration he will know what it means if he has a record of his own cows. What is necessary first of all is a faithful young fellow that will go there and do the work accurately, and keep all his records alike.

I know where there is a young man now in Illinois that wants a job, who would take charge of a cow testing association. We just sent a man up to Brown City. He was in our county for three or four days with our tester and got his ideas about things. He has gone up to Brown City to take charge of a new association up there. I got a letter from another man just the other day asking for a job here in Michigan.

The Chairman: You will notice on the program that we have a question box. As I said at the beginning, we like to come to communities where there is a dairy interest because we have a good discussion and questions that are asked us throw light on the subject and bring out points that a speaker does not always think of when he is talking, but we have a question box as part of the program and would like to have you use it. We cannot have a question box at this session but we will put it on this evening. You are at liberty to ask any question about dairying or dairy farming.

I think I shall have to say that we will leave other questions on this subject for the question box and take up the next subject "How to Improve the Quality of our Dairy Products," by State Analyst Robin-

son. I do not know how well acquainted you people are with Dr. Robinson, but he is doing some good work in the Dairy and Food Department. He was chemist at the experiment station before he came to our department. He is a graduate of the Agricultural College, was born and brought up on the farm and is making for himself a record in chemistry. I am sure that he will have something for us along the line of this subject, although he does not pretend to be a dairyman.—How to Improve the Quality of Dairy Products. He is keeping a lot of manufacturers guessing about their food products in the state of Michigan and I am sure he will give us some helpful hints along this line. I have great pleasure in introducing to you State Analyst Robinson.

## HOW TO IMPROVE THE QUALITY OF OUR DAIRY PRODUCTS.

DR. FLOYD W. ROBINSON, LANSING.

Mr. President, Ladies and Gentlemen:

Mr. Lillie said that we cannot tell very much about a community or a cow or an individual by looks, and the argument that I want to suggest to you this afternoon is that we do not pay quite enough attention to looks, possibly with a slightly different meaning than Mr. Lillie brought out, however.

I remember an incident which occurred in our Sunday school some little time ago, in which I rather got into an amusing discussion with some of the others in the Sunday school class. We were studying the Old Testament characters, Abraham, Isaac and Rebecca, and we came to that portion where Abraham, as you remember, had so much confidence in his chief servant that when Isaac became a man he sent him down into the land to select a wife for his son Isaac. I remember the bulk of the discussion was to the effect that when this man got down there to the house where he found Rebecca that Rebecca had a vision from God that this man came there to select her as a wife for Isaac, to the effect that she was to be the mother of a great race, that it was her confidence in the Divine command solely that persuaded her to go back with this servant and become the wife of Isaac. Of course my study of the women of the bible times has not been sufficient to prove to me that they were not exceptionally different than are the women of our times, and I suggested that it occurred to me that this servant had to make a pretty good account of himself and to describe, in the most glowing terms which his imagination could supply him, the good qualities of this man Isaac. Be that as it may, you know that Rebecca went back with him and it is said that the looks of Isaac were absolutely of no concern to Rebecca and the looks of Rebecca were of absolutely no concern to Isaac, but when she followed that servant to where Isaac was living, and looking ahead she spied a man working in the field and said to the servant, "Who is that man working in the field?" and the servant turned around and said, "That is your master

Isaac," don't you suppose she was the most pleased woman in the world when she found Isaac was a pretty good looking man?

Looks are of a great deal of consideration to us, and the theme I am going to discuss with you this afternoon has something to do with looks because if we pay more attention to looks we are going to improve the quality of our dairy products and we are going to improve the quality of our agriculture, we are going to improve all along the line. Why do you suppose it was that Moses and those old patriarchs did not go into the land of Promise? Back there somewhere, I do not know exactly where, the Old Testament says many of those prophets of old died in faith not having received the promise, God having provided something better for us. That is rather a funny wording. I am not going to preach a sermon but there are two or three thoughts there. "They died in faith not having received the promise, God having provided something better for us," that they, the prophets through us should be made perfect. The point is this, that no matter what our profession is, whether we are ministers of the gospel, farmers or dairy-men or merchants, there is just as much credit on the Divine books for us if we do well that particular piece of work for which we are cut out as for any other profession. We are in the habit of looking up with a certain amount of reverence to the man who is preaching the gospel, and we have a right to. We should, but I want to say that the dairy-man that is getting out of his dairy business all there is in it is contributing to the upbuilding of this universe just exactly as much as the man that is preaching the gospel or the man that is teaching school, providing always that that business is a legitimate business which contributes material prosperity to the world. In other words, all these different lines of business are spokes in a great wheel which is continually kept revolving by nature's Divine laws.

You remember there is a poet of some renown, I believe it was Longfellow, who has given us a theme which we always use when we are pinned down in argument "Hitch your wagon to a star." Now I am going to suggest a new interpretation to that today. You remember we always say "Hitch your wagon to a star, set your ideals high." I do not think that is what that means at all, I do not think it means set your ideals high, I think it means "Hitch your wagon to a star to make use in your life of the things Nature has put there for you to use." Make use of natural things and I hold in the vicinity of Salem, such a fine dairy community as here is spread out, that if you hitch your wagon to a star in Salem you will hitch it to the dairy business. The dairy business is the star of this community and I think that is just what Longfellow meant when he said that.

The way to improve the quality of your dairy products is to improve yourselves in your appreciation of the beauty of things. Looks. Looks are of vital consideration in improving the quality of dairy products and along with that a development of an enthusiasm in the business which stimulates our interest in the looks of things if we can become enthusiastic. Why Mr. Lillie has told us a number of ways in which we can become enthusiastic. We are going to develop the dairy business and along with the development commercially of the dairy business will come an improvement in the quality of the dairy products.

In what ways can the dairy business be improved in quality? It is an unfortunate thing at the present time, so far as improvement of quality of dairy products is concerned, that there is such a great demand for dairy products, particularly butter. One of the greatest obstacles, it seems to me, at the present time to the improvement of dairy products is the fact that there is so little butter in the United States that the markets have not been compelled to recognize sufficient difference in quality. You take the product of your local creamery here and send it to the New York market and it will be sold at Elgin prices, possibly and it is an exceedingly good product, I understand it scores above the highest of any in the educational scoring contest. Along side of that butter is the product from another factory that will not score within five points of what your local creamery will and yet the demand for butter is so great that the commission merchants will pay a price for the low grade article which is in keeping somewhat with the price for the high grade article, simply because of the lack of better material in the markets of the state. This is unfortunate so far as improvement is concerned, so far as the total output is concerned of course it is not so unfortunate.

But let us observe briefly a few of the things that go to work against improvement in dairy products. The very things here that work for the improvement of dairy products, of the milk, will be along the same line, perhaps, that Dr. Marshall will give you tomorrow for combatting tuberculosis in dairy cattle. The same measures that will combat tuberculosis in dairy cattle will work improvement in the dairy business, viz. better care of the animals, much greater cleanliness observed in the care of the utensils and in the stables. Look around a stable that is banked around with hay, on one side straw and chaff, filth and manure, straw underneath, and the product that is produced from that stable cannot be made into a high class butter or a high class cheese or is not a high grade article to sell on the market for market milk, consequently if we are going to begin at the source for the improvement of dairy products we are going to begin right at home in altering the conditions under which our dairy stock are kept.

Now assuming that we have an animal that is paying us a profit in the stable, a dairy cow, it behooves us to take such care of that animal that the product that she puts out in value does not work against delivering to you the highest price that the animal could deliver if she were working under good conditions. It is absolutely useless for you to go to work, or largely useless at least, and spend all your time determining whether that animal is giving you a profit or not, by the various means which Mr. Lillie has suggested to you, and then by a deliberate act of yours go to work and put that animal in a place where she is working under a continual handicap all the time. No animal can do its best, no cow can live up to her best efforts if she has not a good place to work, if she has not congenial surroundings, healthful surroundings, good food, good shelter and good drink; and you must remember that this chaff, this filth, etc., which is surrounding this stall gets into that milk there is an active change going on there all the time, which change is working against a good quality in the product you put out, whether it be milk, butter or cheese. What is the nature of this change?

I am not going to take much of your time this afternoon because these topics are not new to you, they have been hashed and rehashed in our dairy papers and in your farmers' institutes but what are some of the changes? We have in the last two years been conducting in this state a series of tests, examinations of milk, which are unique, I think, in that there is no record of any such test having been carried on before in the United States for such a length of time. Mr. Lillie has authorized, as the man in charge of the dairy work of the Dairy and Food Department, that we conduct during July, August and a portion of September, in some of the various centers of our state a daily examination of the milk that is put on sale, and we have devised tests to which this milk shall be submitted in order that we may determine the quality of the milk that is being offered for sale in these cities. One of these tests is what we call the "coagulation test." We have a small test tube, about seven inches in length, three quarters of an inch in diameter, glass is filled with the milk. It is then placed in a pan surrounded by water and the temperature of the water gradually raised until the temperature of the milk is about 102 or 103 degrees F. That is just a little above the body temperature of man and about the normal temperature of the cow. The milk is kept at that temperature until it coagulates. You remember that is the most valuable temperature for the development of bacteria that naturally grow in the milk. Bacteria are little microscopic plants that abound everywhere in an impure atmosphere; going into the milk, carried at this most valuable temperature and in a medium in which they want to grow rapidly, they will develop in the course of a few hours very rapidly. Now if there are a sufficient number of bacteria in this milk so it will coagulate in less than twelve hours, we class the milk as insanitary for human consumption. That simply means that it is insanitary for any other purpose also. The coagulation of milk, of course you understand, is caused by the development of a peculiar species of bacteria. You may want to know why the coagulating of milk, which is caused by the souring process in milk, marks that milk as being exceedingly bad. Of course in itself it does not, but if there are conditions existing in the stable which are favorable to the development of the bacteria that sour milk, there are also other insanitary conditions there and we find other germs in the milk besides those that sour milk. So we say if the milk sours enough so the casein is coagulated inside of twelve hours that milk is insanitary and what has caused this largely are the conditions to which the animal is immediately subjected. Possibly you all remember that it is no uncommon sight to see a dairy cow that is producing milk where the flanks of the animal are covered with manure and filth. An animal in that condition cannot produce milk that is fit for human food, that goes without saying; on the other hand, an animal in that condition cannot produce milk that is fit to take to a creamery because the buttermaker cannot make good butter out of it; and it cannot produce milk that is fit to take to a cheese factory because the cheesemaker cannot produce good cheese out of it, he will find his cheese becomes gassy and filled with little pinholes, caused by such milk as I have just described.

It is of considerable interest to the dairymen in this community that

not only they themselves, individually, do not keep cattle in such condition but that their neighbor does not keep cattle in such condition, because if Dairymen A, B and C have the best of conditions and Dairyman D has the conditions about which I have been speaking, when the milk goes to the creamery or cheese factory or is sold on the market, Dairyman D's filthy milk contaminates all the rest. That is one of the benefits to be derived from a cow testing association, the development of enthusiasm in a community by means of such an association as Mr. Lillie has described, it will bring all up to the standard of those that are highest.

It may be that the cow is not in the condition that I have described. It may be that her flanks are clean and the dairyman takes some considerable pains in keeping her clean, just as he would his horse. Funny about that, that we think a good deal about a horse that we are driving on the road—and there comes the question of looks again. Why do we spend so much time cleaning off this horse that we are driving on the road just as a matter of convenience, and let that dairy cow that is furnishing food for our family and hundreds of other families stand in the stable in the condition that I have described? It is the looks of the thing. It is not the way the thing looks to us, because we know the conditions but it is the way we cater to the opinion of somebody else. We are anxious that other people shall think well of us and I may say that that motive or desire that others think well of us is one of the most uplifting motives that we have in our public life. Public men as a rule are not any different in motive than is any other class of people. It is very common for us to belittle in some respects the motives of our public men, but I want to say that public men as a rule as a class are governed by just exactly the same motives that every other class of people are governed by. We find black sheep all through the human race and they get into public offices sometimes, and possibly because of that fact that they are more prominent we notice them all the more. Once I lived in Chicago three years and it seemed to me that I never in all my life had seen so many cripples as I saw on the streets of Chicago, and I wondered why it was that there were so many cripples on the streets of that city, and then it occurred to me that probably never before had I seen so many people as I have seen on the streets of Chicago, and that I was seeing the average condition of affairs in a concentrated form.

We have had the passage of a national food and drugs act and we hear in this quarter and in that quarter that the manufacturers are doing their utmost to palm off upon the public adulterated foods, injurious foods. That is not so, it is not true. Manufacturers are just as conscientious as any other class of people, but unfortunately they are human, just like any other class of people, and we find a few manufacturers that are doing unfair things and have unrighteous motives, the same as any other class of people. But that may be a little aside from this discussion and yet in improving the quality of dairy products it is easy to go into these little side lines.

But possibly it is not the dairy cow herself, her conditions may be excellent. The farmer may take a great deal of pride; she may be in fine condition, and possibly it may be the condition of that stable. You

cannot produce a high grade milk product when you have beams overhead in your stable that when you walk across them are continually letting down chaff and cobwebs that are going to fall into that milk. That stable should be ceiled up and I think I would have a coat of whitewash on there. We expect a great deal of good to come from that whitewash because it continually calls the attention of the dairymen to the insanitary conditions there. We like to have the paper clean and neat in our houses because it calls our attention to the dirt when it does get there. That is one of the principal reasons for putting a white coat on a stable. There are lots of ways of making that stable sanitary besides putting a coat of white wash there.

I investigated conditions in a creamery down in the center of the state, which was in the midst of an epidemic of ptomaine poisoning from ice cream. The manager of this creamery is a Michigan Agricultural College graduate, I knew him when he was in college. He took me through the creamery. When I got in there and looked around I just turned to him and looked at him a minute and he knew what I was thinking about, I was thinking that he ought to be ashamed of himself because he knew better. The conditions under which he was selling milk and making butter were so far from what we would expect conditions under the management of an agricultural college graduate. He had simply neglected things and got back into the old rut. I told him the thing to do was to go to work and clean his factory up. He said "I have just gone over these walls and brushed them thoroughly with an antiseptic solution. These walls have been thoroughly disinfected." I said "You cannot tell me that you are going to leave all those cobwebs and dirt up there and apply any antiseptic methods for cleaning out this trouble here." I do not take any stock in the renovating ability of a man who will try to kill something and then leave it there. That is one of the reasons I am not more favorable to the pasteurization of milk. If we have to have bad milk then I say let's pasteurize it or boil it, but remember when you do that you have simply killed the toxic effect but you have left that stuff there just the same. When you aerate your milk you are not removing anything from that milk; you are improving it, that is you are blinding your own senses but take some of that milk and bottle it up when it is warm and then open it up when it is three or four hours old and you will get some indication there of what is going on in that milk that was bottled up when it was warm if it is unclean, but I have seen milk that was bottled up when it was warm and remain for days without any insanitary or undesirable odors developing from it whatsoever. These odors are foreign to the pure product and they have gotten into the milk largely since it left the udder of the cow, so aeration of milk, if we have to have bad milk, is some help, but if we have good milk it is not necessary to aerate it. Aeration simply removes those excess products in the milk that are evidences of an insanitary condition there and that is what pasteurization is. Under our present conditions I am neither running down pasteurization or aeration, because we have not got to the point yet where we can do without them and produce an article we can eat. We have to live on this milk even though it is bad when furnished us, but we must develop enough enthusiasm among dairymen so that after a



while we will get a milk that does not need pasteurization, does not need aeration. We are going to ceil up the stables, keep all dirt away from the milk, we are going to see that the cow's udder is clean when the cow is milked in the evening and when milked in the morning. You do not want chaff and dirt and hair from the udder of that animal falling into the milk. You may say "We have a cloth over the milk pail and strain all the external matter, hair, etc." Strange as it may seem, it is not that hair that does the damage there. I think if I had to have bad milk and had the chance of two milks, one of which was bad and the other good, I would a great deal rather see the milk that is bad come to my house with hair in it and straw in it than I would to have that strained out. I think you all know why. Because if the hair is there I can tell right away that the milk is unfit for use. You may say "If you cannot tell any other way, what difference does it make?" It is pretty difficult sometimes to tell when a milk is unfit to drink and consequences sometimes in consuming a milk that is unfit to drink are very serious. Nature has provided a way and we take advantage of it when we adopt that coagulation test. If that milk is bad Nature has put into it an organism which will curdle it quicker and if it comes to my table curdled three or four hours after it has been milked from the udder of the cow, I do not want anything to do with that milk. Nature has told me that is bad milk because she has put in there an organism that warns us that milk is unfit for use. So it is not the hair and the dirt that gets into the milk that are bad but it is what is on the hair, substances that are soluble in the milk. When you put a cloth over your pail and strain the milk you get out the hair and get out the dirt, but the milk is washing over that all the time and the material that does the damage goes to the bottom of the pail.

I remember a short time ago a health officer was telling me about a man that delivered his milk in cans, in which was a considerable amount of hair and filth, and he was very indignant to think that man brought that in. He was telling me about it and he said "The man got away before I noticed it." I asked him what he did and he said "I went after him and brought him back and made him strain every bit of it." Now that was one health officer's acceptance of removing impurities from the milk. They are not all that way, possibly it just happened that way.

But possibly it is not in the stable, possibly it is in the personal belongings of the man that is doing the milking. We all ought to think of that. Most of us do our own milking. We ought to consider the fact that the housewife would not think of cooking meat or potatoes in the kitchen without washing her hands once in a while. These matters I have to discuss are rather plain matters but I think they have a reason, for many and many a dairyman have I seen go to the barn, after the work of the day or after cleaning off his horses, without paying any attention to whether his hands are clean or not. I do not think we ought to do that. I do not think it necessary to put on a clean white suit, and there are some who go to that trouble; I am not an extremist in that respect at all, but I think we ought to take ordinary cautions to keep foreign matter out of the milk.

Did it ever occur to you that milk will not sour or curdle at all

if the foreign matter is kept out of it? It may seem strange to think that milk would keep forever without souring or curdling. I have seen milk kept for two years under ordinary conditions and in a laboratory, just under ordinary conditions, that was sterilized but had no preservatives in it, that was milked from the udder of the cow. The reason it was kept so well was because there was no foreign matter whatsoever in it. You cannot do that, you cannot produce milk and deliver it to the factory that will keep for two years, and I do not want you to. The lesson is simply this, that we should use all care, and if we do this then we are going to improve the quality of that milk, and if the milk is carried to the factory in that improved condition then the buttermaker is going to make better butter, if he is a competent man. He has something to do with the milk after it is received by him. If he pumps his milk through pipes that are dirty and filthy, he is going to spoil that good milk you have sent him; if he does not keep his separator clean he will do the same thing. I think we have a right to expect the buttermaker to exercise some carefulness because he is trained in the results of sanitary keeping of milk, so it devolves all along the line on each man to do his share in this business and if we develop to our best that one thing that is required of us we are accomplishing the principles that we are trying to accomplish in the world.

If the cow is clean and healthy, if the stable is clean, well lighted, well ventilated, if the milking utensils are clean, if good care is taken of the milk and it is kept clean after it is milked, if the buttermaker and cheesemaker take good care of the product after they get it, we are going to have good dairy products, and we are not going to have good dairy products in any other way.

The Chairman: No one was designated here to lead in this discussion but the subject is open for general discussion. I would like to have a general discussion of the subject. Has anyone anything they would like to say regarding this matter?

#### DISCUSSION.

Member: I would like to ask Dr. Robinson if atmospheric conditions have not considerable to do with the keeping quality of milk?

Dr. Robinson: You mean heat and cold?

Member: You notice when we have a thunder storm and a humid atmosphere the milk will not keep as well as with a cold atmosphere?

Dr. Robinson: It is quite true that milk of ordinary quality, ordinarily poor in sanitary qualities will sour a little more rapidly in close muggy weather which prevails at the time of a thunder storm than in clear weather. I do not believe there is anything in the thunder storm itself that will affect it, simply the conditions at that time are favorable for the rapid growth of bacteria. I think your observation is correct there.

Member: I would like to ask if the milking machine is not a cleaner, more sanitary way of getting milk from the cows?

Dr. Robinson: Mr. Lillie can tell you about that. He knows about these machines.

Mr. Lillie: You can clean milk milking by hand. You don't have to have your cows covered with filth, you can have clean cows. Before

you begin to milk if you brush off the udder and flanks so there will be no particles of straw or dirt to drop into the milk pail and are reasonably clean and careful about it, you are not going to get very much dirt in the milk. When you come down to the point, you can get practically as clean milk without the machine as you can with it if you are sufficiently careful. You have to have a clean cow, a clean man to milk, clean conditions in the stable, and for the purpose a small top milk pail so there is not so much chance for dirt and dust to fall into the pail when you are milking, and with these factors you will have clean milk. The milking machine will give you clean milk but you do not want to put the cup of the milking machine on a test that is dirty for if you do the suction will draw some of the dirt into the tubes and into the pail. However, there is not the chance for the dust in the atmosphere of the stable to fall into the milk because it is all covered up. In that way there would be a benefit, but if you have dirt and dust on the teats or udder of the cow when you put the teat cup on, the suction will cause some dirt to be drawn in there. You must be careful about that or you will have a struggle with bacteria with the milking machine, as well as you would by hand.

Mr. Powers: I think one important point in regard to this improvement of the quality, about which the doctor has been speaking, is the amount of deterioration brought about largely through the introduction of the hand separator. This new method is invading Michigan and it is coming rapidly too; farmers are changing from the whole milk to the gathered cream system, and I believe this system is lowering the grade of butter that is being made here in Michigan. What is the reason for this? Why should the cream from hand separators make a poorer quality of butter than that from the whole milk? The answer is at the farm end of the proposition, and as Dr. Robinson said, it is to the interest of the farmers of Michigan to look carefully at those points now, or there will be some money lost in the butter business here in years to come. I do not know where it is going to end but we are beginning to feel the effects of it now; the market is over-crowded with a poor grade of butter for which the creameries cannot get a first class price. The creameries are losing money and their loss is going to fall back on the farmers because the creamery cannot stand it and will naturally pay less for their cream. They are doing so now. Centralizers here in Michigan and in other places are paying from one and one-half to two cents below the market price for hand separator cream, just on that account. They have had to do it in order to protect themselves. The idea of the farmers being independent in the matter of delivering cream I think it is a mistake on their part because the creameries are up against a hard proposition in this one matter. A farmer will say, "I cannot deliver my cream every other day because I will get as much for it if I leave it at home until I get my can full and then take it to the depot." There is a question whether that is a good policy for the dairymen to follow out.

Referring to where this trouble begins, I think in most cases where the cream is first injured in quality is in the manner in which it is put through the separator. I do not say that everyone uses his separator in the same way but I am satisfied that many dairymen will run

the milk through their separators at night, simply rinse the separator out, then run the cream through in the morning without first properly washing the separator. Such a practice is detrimental to the cream. Of course if you rinse your separator out and get it so the water will run clear out of it, if you leave the water in the separator over night, especially in the summer time, I will ask the doctor about the quality of that water. I think it is a great mistake for the farmers to neglect caring for their separators.

Member: Would it not be a benefit to the dairy interests if at the time the state inspector visited the farm, if he would score on the cleanliness of the barn, the way the milk is handled, and send that score to the buyer of the milk and at a meeting, or sometime during the year, have that score read? In that way every one would have an interest in keeping things right.

The Chairman: There is no doubt but you are right but the trouble is the Dairy and Food Department cannot do much inspection, simply because it has not the money to do it with. It is an immense job to visit all the dairy farms in Michigan.

Member: They visit the farms in this vicinity once a year.

The Chairman: You are fortunate, they are looking after you.

Member: I would like to ask another question. It is not true that the Elgin butter is largely made from the product of the hand separator, and that butter sets the quotations for our country? There is more separator butter in Illinois, I think, than any other state in the Union.

The Chairman: There is lots of that butter from whole milk but some is made from separator cream.

Dr. Robinson: I do not understand that the objection to hand separator cream is in itself an objection to the hand separator. It is an objection to the method we have gotten into in the use of the hand separator. Theoretically, as a matter of economy and a matter of business, I do not see why the hand separator is not a success, but practically what is the result? The dairyman who brings his milk to the market takes it every day because of the condition, he has to get it there before it spoils. If he runs the milk through a hand separator he does not have nearly the quantity and he thinks it would not pay to go to town with such a small amount of cream, so he stays home and lets the cream accumulate for three or four days, and I have known farmers to keep their cream for a week. That is the trouble. It is not a prima facie case against the hand separator; it is a prima facie case against the farmer. If they will go to work and take care of their hand separators and take care of their cream and deliver it as frequently as they would otherwise the milk, they would get as good conditions as they do the milk.

The Chairman: They use the hand separator so as to get out of going to the factory so often.

Member: Don't they neglect to take care of their cream? If they kept their cream at the right temperature there would not be any trouble.

Dr. Robinson: There are two maxims that the department has tried to impress upon the dairy interests of the state and if they were fol-

lowed so much bad cream would not be the result. Those two things were first cleanliness and second cold. You speak of cold and I will say that is right provided you preface that cold with cleanliness, but if you do not do so, no matter how cold you keep the milk, it is going to keep on deteriorating hour after hour until it is made into butter, and will then too.

Member: I think the hand separator saves the farmer so much work that he can afford to take care of his cream.

Dr. Robinson: There is no question but it is easier to draw and you have the skim milk at home. It is not the problem of what can be done; there is no question as to what can be done, but the difficulty is with what is practiced. We know how that is. There is the condition Mr. Powers mentioned and it is a vital condition. We cannot at the present time make as good butter and as good cheese out of hand separator cream as we can out of whole milk, not because it theoretically is not possible but because we get lax in our methods of care not only of the milk but of the cream itself.

The Chairman: Of course this talk about the hand separator does not apply so much to this community as to many communities. For instance we just came from Tecumseh, in Lenawee county. The creamery down there does not receive a pound of whole milk. It is all gathered cream from the hand separator; up here there is hardly any hand separator, it is nearly all whole milk.

Dr. Robinson: Do you think that will explain the high score of butter here?

The Chairman: I think it does largely. I said this morning that the buttermaker would be a poor buttermaker if he did not make good butter out of good milk. If it is good milk he has a chance, but as Mr. Powers intimated, the hand separator is gradually coming into use. I do not know how soon it will bother this creamery here, but the difficulty is we cannot keep it out. One half of Michigan cream now is separator cream and I do not know how much longer the whole milk patrons will persist in hauling the whole milk, but you can make just as good butter out of hand separator cream as you can out of cream from whole milk if you only get the cream to the factory in good condition. That is all there is to it. The hand separator is not to blame. You can keep the hand separator cream a little longer than you do the milk and have it in good condition. Probably Dr. Robinson will not agree with that. One man will keep hand separator cream two or three days and deliver it at the factory in better condition than some people will have it delivering it every day.

Mr. Powers: That is the idea, exactly.

The Chairman: If you skim a good thick cream with the hand separator there is not much in there to spoil. If you had the butterfat absolutely pure you could keep it indefinitely, couldn't you, doctor?

Dr. Robinson: Yes, but that is far from it.

The Chairman: You have taken out most of the food for bacteria when you have taken out the skim milk.

Dr. Robinson: It is not as good a culture media but they will grow good and fast.

The Chairman: Then you have so much less to keep cool that it is

not necessary to furnish hand separator cream every day to the creamery to make good butter.

Member: In our dairy association we are having the same difficulty. The hand separators are coming in and we are allowing them but it is under strict restrictions and I will say so far, although the bulk of our material is whole milk so far, we are getting good results. Our manager has told the hand separator men that they can come in under certain restrictions and he has shown them plainly that one batch of bad hand separator cream will spoil the whole output; he also made it plain to them that such influence would have a bad effect on their pocket-books and last year and the year before we have had good results.

The Chairman: If you can stick to that you will not have much trouble, and I hope you will stick to it.

Mr. Powers: That is the point I want to speak about, the creameries upholding cleanliness in the milk. If the gentleman that just spoke was in some localities he would find the manager short a whole lot of cream if he made that announcement, because the farmers have so many opportunities of selling their cream and getting as much for it as is paid at the creamery.

Member: We are pretty close to Detroit and have competition on that side. Our manager is a pretty wise little fellow, he does not go after the farmers hammer and tongs. He said to one man, "If I bought that cream and put it in my vat I would spoil 600 pounds of butter," and the farmer said "I will take that home and take more pains with my cream hereafter." He has worked it in that way, and so far very successfully. Of course the majority of our stuff is whole milk.

The Chairman: The man who has been a good creamery patron under the whole milk system is quite apt to be a good patron with the hand separator. He has learned some things about dairying and he takes more pains. Up in the northern section of this state, where they began with the hand separator and only a few cows, they are far away from the market and have to ship their cream a long distance and had to pay as much as a half a cent a pound for shipping, so they got into the habit of keeping their cream too long and the centralizers have got into the habit of taking that stale cream. Those people are the ones that are difficult to change. The cream in our section that comes in is good cream and makes good butter simply because it is taken care of, and the farmers understand something about taking care of it.

Member: Has any tests been made with milk from machines and by hand to see whether there is any difference?

Dr. Robinson: There have been some tests made but Mr. Lillie is more familiar with that than I. He has made a special study of milking machines and can probably answer that question.

The Chairman: Mr. Gurler has just written a new book, entitled "The Dairy Farm," and in that he discusses the milking machine quite thoroughly. He claims on the average he gets better milk by the milking machine than by hand. Formerly Mr. Gurler produced certified milk for customers in Chicago and it bothered him in hand milking to keep his milk up to the standard. He had to look after that point very carefully indeed, and yet with the milking machine it would be no trouble at all to keep the milk within the standard set for certified

milk. Some people claim that it is possible to produce milk with the machine that is absolutely without bacteria. It is certain that if you have a clean udder and your machine is clean there is no chance for any dirt to get into the milk, but bacteria are pretty small plants and they have a way of getting into places where you would not think they could get it. That is as well as I can answer that question.

Any other remarks on the subject of improving the quality of dairy products?

This being a dairy community we ought not to hold this session too long because dairymen have to be home to milk, and it is after four o'clock standard time now. I suppose it would be better to close the meeting without carrying it along too far and leave further discussion for another time. If there is nothing more to be said on this subject, I will dismiss you until 7:30 this evening.

#### FRIDAY EVENING SESSION.

Meeting called to order at 7:30 o'clock by President Lillie.

The Chairman: We will now collect the questions and open the question box.

#### QUESTION BOX.

Question No. 1. Will it pay to have a milking machine for 15 cows? Are they very long lived?

Mr. Lillie: I suppose these questions on the milking machine would all be referred to me as Dr. Robinson refused to say anything about them. I do not think it would pay to have a milking machine for fifteen cows. It is not much of a job to milk fifteen cows. I do not know what the limit would be to pay for a milking machine, but really I think it would be necessary for a man to have more than that number of cows to make a milking machine pay. You do not gain anything by milking with a machine unless you have three or four machines. One man will not milk cows faster with a machine than one man would milk by hand. The only way you can gain is to have three or four machines, because one man can run that number and in that way milk six or eight cows at a time, consequently there is a gain, but the machine would not milk as fast as a good milker. Would it pay to have three or four machines for fifteen cows? A machine costs \$75, and a man has to go to the expense of piping his barn and have a vacuum power, if he has not a gasoline engine he has to have some power. That is quite a large investment and in my opinion a man would not want to make the investment unless he had more than 15 cows.

Mr. Powers: Wouldn't one machine milk faster than one man could?

Mr. Lillie: Not very much.

Mr. Munn: One man could not milk two cows at a time.

Mr. Lillie: No but one man will milk a cow quicker than the milking machine will; one man will milk two cows almost as quick as the

machine will milk two cows. When you take into consideration that the cow has to be hand stripped, putting on the machine and manipulating the udders and taking off the machine, one man will milk two cows as quick by hand as he could with the milking machine and that would not include the washing of the machine; but when a man can milk eight cows at a time he can milk with the machine forty or fifty cows an hour and when you keep forty or fifty cows you can certainly see that a machine of this sort is of more importance than with a small number of cows. If you are going to keep a small number of cows you cannot afford the milking machine, but as to just what the proper number would be to make a machine valuable I do not know.

Mr. Blake: We have one milking machine for 10 cows and we can get through with our work a half hour quicker with that machine than we could when we were milking by hand.

The Chairman: Then my judgment is not very good, is it? I never used just one machine.

Member: Do cows do fully as well when milked by a machine as they do when milked by hand? I have heard they did not.

The Chairman: I have heard they did not and I have heard they would do better. When we milk a considerable length of time by hand and then put on the machine the cows do not seem to drop off in their milk. Whether a cow will give as much milk by a machine as she will by hand I do not know, I do not believe that anybody knows. I am not here to brag about the milking machine or extoll its merits so as to get any one to purchase a machine. I want no one to purchase a machine in my recommendation. I would want you to investigate it more carefully. The last part of the question is "Are they long lived? The mechanism of the milking machine, it seems to me, is almost perfect. There is nothing about it to wear out and I do not see any reason for their not lasting a number of years. There is nothing about them that you will ever have any trouble with, except little springs costing a penny apiece, and you will not have much trouble with them, but the machine itself seems to be almost perfect and it does not bother. If you never ran a gasoline machine sometimes you have trouble using the milking machine, but the machine itself is absolutely reliable. It will go and the yield of milk will depend somewhat on the man that is operating the machine. Is that question answered satisfactorily to the questioner?

Question No. 2. What justice is there in taxing oleomargarine?

The Chairman: I will ask Dr. Robinson to answer that question.

Dr. Robinson: I wonder if that means colored oleomargarine? I have always taken this position on the colored oleomargarine proposition, viz.: That the yellow color in butter is the trade mark, if you will, by which that product is known on the market of the world. Now, as oleomargarine is colored the same color or, as most of the laws put it, in imitation of yellow butter, it is counterfeiting in the markets the trade mark of butter, and we know how we deal with the counterfeits of other patented trade marks. They are prohibited. The government does not exactly prohibit this but it says "If you shall utilize this trade mark you shall pay a royalty for so utilizing it, and this royalty in nine and three-quarters cents a pound. You remember that



there is a restriction on only one color so far as oleomargarine is concerned. If oleomargarine were sold on its merits, by means of which it had sought to build up a product of its own of distinct qualities and command a distinct place in the market, this controversy about color would never have arisen; but they have chosen to use for their product a color which had been in use from time immemorial for another well known product, and consequently we must assume that the only reason for which this yellow color was used in oleomargarine was to permit of deception of some sort in passing it off as butter. For that reason Congress has seen fit to make it more difficult to pass it off as butter by paying a tax and imposing certain other conditions, such as stamping, etc., which will advise the purchaser. In some states, such as Michigan, it has been considered that even that is not sufficient to warn the consumer that he is getting oleomargarine, consequently the artificial color has been absolutely prohibited. I think that is a just law.

Question No. 3. Which is the more profitable, to put corn into the silo that will go 100 bushels to the acre, or 50 bushels or less?

The Chairman: Which is the more profitable crop to raise, one that will grow fifty bushels to the acre or the one that will grow one hundred bushels to the acre? I suppose the person that asked that question had this in mind—"Shall I plant my ensilage corn so thick that there will be small ears on it or just thick enough so I can raise 100 baskets to the acre?" Which would be the more profitable for him? I think for ensilage we must take into consideration the food value of the entire plant, not the ear alone or the stalk alone. When we plant corn three or four kernels to the hill, three feet eight inches or four feet apart we plant with the idea of getting the largest yield in ears. That is what we are after. I do not think you will have as high food value per acre from the plant in that kind of planting as you would if you plant it thick, had perhaps smaller ears and more stalks to the acre—smaller ears but of course more of them. My idea would be to plant, perhaps three times as much seed to the acre for ensilage as you would for husking, but not more than that. We do not want to get the corn so thick as to prevent the development of a perfect corn plant. It must not be so thick but that you can give it a thorough intertillage; it must get its due proportion of sunshine so it will properly develop and get a full amount of food constituents in the plant, but if you plant it the way I have indicated you would have more than fifty bushels to the acre if you have a good crop, and you will have pretty fair sized ears on the stalks. I would not hesitate putting corn yielding one hundred baskets to the acre in the silo, if you put it in in time, when properly matured. If you let the corn get ripe enough to husk you must wet it down or a large percentage of the food value will be lost, but if you have moisture there very little will be lost. With a good silo and proper conditions you need not expect a loss of food value of over five per cent, and we could not cure it in any other way with as small a loss as that.

Question No. 4. What per cent of the students that graduate from the M. A. C. make farming their life work?

The Chairman: Dr. Robinson, will you answer that?

Dr. Robinson: I expect, Mr. President, that a very small percentage of M. A. C. graduates have made farming their life work. I want to say, however, that I suspect that answer might have been anticipated and might be judged as a criticism, but when you remember that the graduates of the M. A. C. have been in such demand, immediately after graduation, from other state institutes and government institutions demanding them to take charge of lines of investigation in agriculture, than you do not wonder at that and can see the justice of it. While they may not actually engage in following the plow themselves, by far the majority of them are actually engaged in agricultural work in some of its branches. I consider that I am engaged in agricultural work, although I am not actually on the farm.

The Chairman: A great many of the graduates of the agricultural college are poor boys that have no farms to farm when they get through, and may feel that they cannot afford to go to work on a farm at common wages when they can get double the wages in some other line. For instance, we had a banker in our town by the name of D. C. Oakes, who was a graduate of the Agricultural College. If that man had a farm when he got through college there would not have been any better farmer in this country, but he did not have any; he taught school for a couple of years, then went into a bank learned banking and afterwards owned a bank of his own. He drifted away from the farm simply because there was not the opportunity for him when he got through the Agricultural College. Hundreds go in other directions because of lack of opportunity.

Question No. 5. Is cottonseed meal as good and as cheap a grain to feed with ensilage as there is on the market?

The Chairman: I think so. If you feed cottonseed meal with corn ensilage I do not think there is any better feed. I do not know just how much cottonseed meal I would want to feed as the only grain ration. I intended to feed my cows this winter their entire ration of cottonseed meal but I did not. The reason being because our butter in the creamery was becoming a little tallowy, a little crumbly, which comes from the fact of so many of the patrons feeding cottonseed meal to their cows. It tends to make butter a little too hard in the winter so I changed and I am feeding one half of concentrated feed oil meal instead of cottonseed meal. Oil meal tends to make a softer fat than cottonseed meal. In the South they feed as high as seven eighths of a pound of cottonseed meal to dairy cows in a day. I have fed cows four and five pounds and once I fed a cow six pounds of cottonseed meal a day and saw no bad effect from that, so I am pretty safe in saying that you can make your ration entirely out of clover hay, corn ensilage and cottonseed meal with the assurance that there is no food on the market today that will furnish you as balanced and liberal a ration as that for as little money. Cottonseed meal contains 50 per cent protein and you can buy it for \$30 a ton delivered here, and I know of nothing that will take its place. The oil meal does not contain anywhere near as much protein and you would have to pay \$4 or \$5 more a ton for it.

Question No. 6. Does cottonseed meal tend to produce abortion if fed to dairy cows?

The Chairman: I do not see why it should although I cannot give

you any facts in regard to that. I never heard the question brought up before. I do not see why it should any more than other feed. I do not believe it does.

Question No. 7. What injury would the bacteria that sour milk do to a person that drank the milk just before it became sour?

The Chairman: Dr. Robinson, will you please answer that?

Dr. Robinson: Evidently there is a little misunderstanding on that proposition. You remember that one of the latest statements of a leading German bacteriologists is that by drinking the culture or bacteria that produce souring milk we can produce longevity, so we must conclude that the actual bacteria that cause the souring of milk are not injurious to health but are a benefit. Just how much benefit I am not prepared to state but the point that we were trying to bring out regarding the bacteria is that we liken the bacteria of sour milk in milk to the red lantern that we hang out in the street when the ditch is open. The red lantern does not hurt anybody but it tells you the ditch is there; the sour milk bacteria do not hurt you, they are your friends by telling you the milk is dirty.

The Chairman: We are now ready to begin the regular program of the evening. The first on the program is "The Dairy and Food Laws and their Enforcement" by State Analyst Robinson. Dr. Robinson talked to you this afternoon so he needs no introduction here this evening.

## DAIRY AND FOOD LAWS AND THEIR ENFORCEMENT.

DR. FLOYD W. ROBINSON, LANSING.

Mr. President, Ladies and Gentlemen:

The dairy and food laws have been called to our attention considerably the last few years. You will remember that the year 1906 is a year unique in the annals of food legislation because it witnessed the passage in the national congress of the first food and drugs act that has ever been on the statute books of the U. S. government. For the last twenty years people, guided by certain enthusiastic men, have been clamoring in congress for the passage of a food and drug act, and it culminated on June 30, 1906 in the passage of a law in Congress, which has become a common topic of conversation ever since.

Michigan has had a dairy and food law ever since 1895 when the first dairy and food department was organized, and a man by the name of Storrs was the first dairy and food commissioner and our revered Dr. Kedzie was the first analyst located at the state college. Massachusetts had a food law longer than Michigan. Vermont, New York, Illinois, Ohio, Indiana and the majority of our more advanced states, also our sister state on the West, Wisconsin, have very creditable food laws.

A food law is destined primarily for the protection of the consumer and it is unique in that respect because there are few laws that are

passed and designated to protect solely or particularly those who consume the product. We have laws passed to prevent passengers from defrauding the railroads, we have laws passed to prevent guests from defrauding a hotel keeper, laws passed to protect the liveryman and various and sundry laws which have been passed to protect private interests from infringement by the people, but until the passage of a food and drug law in our states and in our government the people as a class have not been generally protected by legislation, and yet there is no single subject that comes to our attention in a material way that is of such vital importance to the people as a law, a statute regulating the substances upon which we are compelled to live.

The national food and drugs act is clearly and solely an interstate law. You will remember a precept of our government is that the state is sovereign in the administration of laws regarding its territory, with few exceptions, notably the internal revenue office, and the national government has nothing whatsoever to do with the people except where-in they traffic from one commonwealth to another, which is called interstate traffic. A national food and drug law is concerned, I say, with this interstate traffic. If a manufacturer in Michigan sends his food products into the state of Ohio then it is a subject pertinent for national inquiry as to the quality of the products which are passed across the border line. If a manufacturer in Ohio sends his product into Michigan then it becomes a subject of national inquiry as to the condition of those products which pass the border line; but if a manufacturer in Michigan sells his products, as you know, in Michigan it is of no concern to the national government what that product is, barring the exception I made. So the state law is designed to protect the people within the state from fraud and injury from manufacturers and dealers living within the state.

The state dairy and food department has some authority over the manufacturer living in another state but it is an authority which is governed entirely by his control of the product after it reaches the state. For example, we will say that a manufacturer in the city of Toledo sells vinegar in the state of Michigan. Our control over that product in this state is limited to controlling the dealer or the jobber who buys of the man in Toledo, with this exception, that one special provision of the national food and drugs act makes an article adulterated if it is in conflict with the laws of the state into which it is shipped, so if this article that comes from Ohio is in conflict with the dairy and food department laws of this state, then under the national food law that article is adulterated and the dairy and food commission of this state is empowered by the national government to begin proceedings in the U. S. Court against the manufacturer in the state of Ohio. I will say, however, that rarely is this resorted to. I think of no single instance in which it has been resorted to in this state because little difficulty has been experienced in eliminating the product whenever it was clearly shown that it was adulterated.

Now there is great need for a dairy and food law. I think that even yet the people generally little appreciate the crying need of the inspection and examination of food stuffs, but how great concern is it to us if there is any measure that is passed through the legislature that gives

to each one of us, we will say, an increased profit of \$1.00 during the year. Some system of economy is legislated through by means of which our taxes are a dollar cheaper this year than they were last year, and it is a very commendable thing. but did it ever occur to us that by means of lax dairy and food laws or lack of dairy and food laws we may be paying to our local dealer, and he in turn be paying to a manufacturer, somewhere in the neighborhood of \$100 every year that we ought not to be paying, simply due to the misrepresentation of goods? If you go into a clothing store and there are two suits of clothes, one of which is cotton and the other wool, one of which costs \$10 and the other \$15, if the dealer sells you the cotton suit for \$15 and represents it to you as wool haven't you a grievance against that man to the extent of about \$5.00? What is the damage to you from being compelled to wear the clothes that you supposed were different from what they really are? A dairy and food law protects you right along this line, not in clothing but in food matters. You go to the grocery store and buy butter and pay thirty cents a pound for it. We will suppose that proves to be oleomargarine and you pay thirty cents for that. The oleomargarine looks just like butter and you cannot tell the difference in its food value; it is a wholesome product; I have no objection to it from that standpoint but the true market value of oleomargarine is fifteen cents a pound and the true market value of that butter is thirty cents; the true market value of the suit of wool clothes is \$15 and the true market value of the suit of cotton clothes is \$10. If you want to buy oleomargarine, well and good; if you want to buy a cotton suit well and good; if you want to buy butter, knowing it to be thirty cents a pound, you have a perfect right to that and should be protected in that, but if you want to buy oleomargarine, we all of us ought to have the opportunity of taking advantage of that natural difference in price that normally exists in buying that pound of oleomargarine for its proper price (15 cents), and that is one of the blessings that a dairy and food law is supposed to give to the consumer. It is supposed to compel the proper labeling of food products. Butter is sold as butter, oleomargarine is sold as oleomargarine, maple syrup is sold as maple syrup and a sugar syrup as sugar syrup or cane syrup is sold as cane syrup, the sausage as sausage and the compound sausage, mixing up the meat with meal, is sold as compound sausage and not as sausage.

That is the object of a dairy and food law. The most of us think that the object of a dairy and food law is to prevent the admixture of injurious ingredients in food products, and that is perfectly correct but that is the point that causes the department the least of its effort. We have little difficulty in eliminating injurious ingredients in food products because once we can establish the fact that they are injurious we will have no difficulty in any court in the state to eliminate that product. A few years ago it was very common for a class of articles, known as extracts, lemon extracts, to be adulterated with an exceedingly poisonous ingredient. I will tell you what that is. It may not be generally known how a lemon extract is built up. I remember of reading a short time ago a flaring statement in one of the Detroit papers to the effect that it had been discovered that a great many of the extracts on the market contained an excessive amount of alcohol and consequently it

seemed desirable that the food department ought to busy itself and look those things up. We know a true lemon extract is made in the following way—it consists of oil of lemon five per cent, which is derived from the lemon peel in solution in alcohol, so when we examine the lemon extract one of our best indications of any impurity is if it contains a certain quantity of alcohol. The more alcohol lemon extract contains the greater degree of purity. A true lemon extract being five per cent lemon oil will have to contain about 80 per cent of alcohol, stronger than any intoxicating beverage on the market, because it takes 80 per cent alcohol to cut 5 per cent oil of lemon, just as it takes so much turpentine to cut your linseed oil, to dissolve it, that is what we speak of when we say cutting. It takes 80 per cent of grain alcohol to dissolve the required amount of oil of lemon to make a normal lemon extract, consequently when this paper printed some existing amounts of alcohol in some extracts it was evidence to some that they had got onto a bottle of good pure extract.

There is an alcohol which we commonly know as “wood alcohol” which a few years ago was extensively used to dissolve this oil of lemon the reason being that wood alcohol is very much cheaper than the grain alcohol. By the way, wood alcohol is the present article that is used at the present time to denature grain alcohol, due to that act passed by Congress recently on the denatured alcohol proposition. This wood alcohol was masquerading as grain alcohol. It was not thought that any manufacturer would have the audacity to put wood alcohol, an exceedingly poisonous substance, into a food product, but it was done and it passed ground for sometime before it occurred to anybody to test those products as to the kind of alcohol used, and when it was found that wood alcohol was used the manufacturers were notified immediately and those products were withdrawn from the market at once without a single case where it was necessary to prosecute a manufacturer for using wood alcohol on the ground that it is injurious to health. So when we find a product containing ingredients injurious to health we have little difficulty in securing its removal from the market, but it is this question of fraud and deception that is of the greatest concern to the department, and that is what the department is fighting, fraud and deception.

We want a miller when he puts out a product and labels it buckwheat flour, to put out pure buckwheat flour and not a mixture of low grade wheat flour and corn meal with the buckwheat flour. We assume that this community and the several communities of our state have reached a sufficient standard of intelligence so if they want to buy corn meal they will ask for it and if they want wheat flour they will ask for it, and when they ask for buckwheat flour they will ask for buckwheat flour. They tell us buckwheat cakes are not as good as cakes from buckwheat flour and wheat flour together, but if they are not any of us that believe that can do our own adulterating when we make our cakes in the morning. We think a label that says buckwheat flour ought to mean buckwheat flour, and it is going to mean that.

Possibly you remember the exhaustive litigation of the state during the last summer on the question of sausage. It caused some considerable amusement on the definition of what is a sausage through the

country. That product has been more or less of a joke for a good many years. You remember that famous song "Oh where oh where is my little dog gone?" It brings to mind some things that have been passed upon in connection with sausage. I believe when a housewife goes into the market to buy sausage she has a right to believe that she is getting a wholesome product and an all meat product, in other words we believe sausage to be an all meat product ground up and properly seasoned to suit the tastes of different consumers. We do not believe the manufacturer has the right to send out to this lady when she calls for sausage a product that contains 10 per cent of corn flour and 40 per cent of added water. We do not think that is right and we are not going to permit it. It may be possible that it is proper for a product containing 10 per cent corn flour, 40 per cent water and 50 per cent meat to be sold, but we do not think it should be permitted to be sold as sausage. If they want to sell it, we have suggested that they label that "Compound" and right on that print in distinct type 50 per cent meat, 10 per cent cereal, 40 per cent water, and that means 40 per cent added water, because meat contains a good deal of water.

Absolutely lean meat is about three-quarters water. One of the arguments was that we should not condemn adding water to the sausage because ordinary meat is three-quarters water anyway, and the suggestion was made if the Lord Almighty put 75 per cent water into meat that we ought not to object if the manufacturers put a little more in, but we have considered that the Lord Almighty knew his business when he stopped at 75 per cent and we do not think it is man's province to improve upon those manufacturing methods of providence.

Member: What about the farmer coloring his butter then?

Dr. Robinson: I will tell you what I think about the farmer coloring his butter. I have absolutely no objection, so far as I am personally concerned, to the elimination of artificial color out of any food product. For my own concern, I prefer butter that is not colored, but there are reasons, there are good reasons I think that will permit the coloring of butter with a harmless coloring matter, such as we permit in other pure products. The law permits the use of artificial color that is not injurious in any product, where it does not conceal inferiority or is not an index of the strength of that product. For instance we would not permit the coloring of vanilla extract with caramel coloring, by means of which it would be made browner. The reason for that is the use of carmel color in vanilla is using a color that is a guide to the public of the strength of vanilla. A lady goes into a store, picks up two bottles and will get something of an idea of the value of those two bottles through looking at the color. She knows in making vanilla extract that if it is percolated longer, whereby she gets more flavoring strength, she gets more color and consequently she picks out the one having the deeper color, so we would prevent a manufacturer putting out a weak vanilla, which naturally would be a light yellow color, and adding a lot of burned sugar to that to deepen the color. For the reason that the color in that finished product of butter is not essentially an index to strength or quality as it is in vanilla extract we allow the coloring of butter. So far as I am personally concerned, as I have stated, I have no objection to the coloring of butter, I have no particu-

lar argument in its favor, and I think the time will come when butter will not be colored. That is my personal opinion, but at the present time we are compelled by law to recognize the legality of using an artificial but not an injurious color in butter. Lemon extract we permit to be colored, because color in a lemon extract is not an index of quality. In fact the majority of the lemon extracts on the market at the present time are colored because we can get lemon extracts pure and strong that are not colored and they are just as white as water; we can also get them strong that are deep in color. Color has nothing to do with the quality of lemon extract.

This subject is one in which I am continually engaged, not talking of but working in in conjunction with this pure food movement and I am extremely liable to talk at too great length on the matter, but I shall try not to tonight. I will simply give you two or three illustrations of what the work is like.

Now we take maple syrup. There has been a product in the states of Michigan, Ohio and Vermont known as maple syrup and maple sugar which has an exceptionally valuable place in the market. Most of us enjoy getting a gallon or two of genuine pure maple syrup during the year, so we naturally feel quite indignant when a manufacturer comes on the market and puts on a product made from dissolving granulated sugar in water and adding a little caramel color to imitate maple, and palms that off on us as maple syrup. That product, so far as food value is concerned, is as great as maple syrup, just exactly; but there is something about maple syrup that we like and we are willing to pay more than its food value would warrant in getting that article; so when this manufacturer puts this substitute in our hands we are justly indignant about it. Now if we are going to use this granulated sugar syrup on our table we have a right to use it, but at the same time we have a right to take advantage of the natural difference in price existing between maple syrup and sugar syrup in getting the latter. A gallon of sugar syrup can be produced for fifty cents, or approximately 50 cents, and a gallon of maple syrup will demand \$1.50 on the market. I usually buy about seven gallons of maple syrup every year and I pay \$1.50 a gallon. I think we have a very choice maple syrup, it is a low colored product and has a very delightful flavor, but I would not want to pay \$1.50 for sugar syrup that I knew I ought to get for 50 cents, while I am willing to pay \$1.50 for the maple syrup, due to the development of the tastes for that particular article, and most of us are so inclined.

Coffee is a product that we do not like to have colored and substitutes for coffee berries passed off on us for coffee. If we are going to have these products we like to have them with our eyes open and it is as much our privilege to take advantage of natural difference of price as it is for someone else to have that little extra price, which you can see on a pound of coffee may be fifteen cents. By the time you have bought the amount of coffee that most of our families have to buy during the year, in this one article alone you will have saved more than you would save by taking advantage of an economy in taxation, which later argument would be sufficient to move us in our votes. A matter of a dollar in taxes is a matter of vital concern to us and we go in an election to-



day and vote for that proposition, but a matter of ten cents in tea and fifteen cents in coffee, whereby those various things together amount to many times what the other would amount to, you pass over with indifference, seemingly. When the public becomes sufficiently familiar with just exactly what is going on, this indifference becomes indignation, and that is the reason the people of the United States have stood so strongly by Dr. Wiley, who has been carrying on this fight for pure food and pure drugs.

I have not said anything about drugs. I was coming from Jackson some time ago on the Michigan Central train to Lansing, and right in front of me sat a young woman with a little baby, and this little baby was quite fretful. The mother was worn out and tired and it annoyed her to think that the baby was crying so much and, strange as it may seem, there are always a few people on a car that seem to become exercised over the fact that there may be a baby on that car that is crying and annoying them a bit, it not occurring to them that they may have been in the same position themselves sometimes; but nevertheless we know it is an annoyance to the mother because she fears it is troubling somebody else. This baby was crying and the mother, becoming impatient, finally reached out into her bag and took out a bottle of something and a spoon and gave a spoonful to the baby. In a minute the baby was quiet, she laid it on the car seat and it went to sleep, and she placed the bottle on the car window facing me, that was luck too. I read the label on that bottle and what do you think it said on the label? This would not have been on the label had it not been for the national food and drugs act.) It said "Mrs. Winslow's Soothing Syrup, containing so much percent of morphine." The national food and drug act does not prohibit the use of morphine in Mrs. Winslow's soothing syrup but it does require that the label shall warn parents that morphine is there. I remember giving that illustration over to the Mason High School and compared it with another that seemed to be somewhat popular with the students there. I asked what they would think of the principle of the school, who was in then the room, if when the janitor came up and announced to him that there was a leak in the plumbing in one of the lower rooms, he would turn around and thump that man on the head and send him out? They would not stand for that for a moment, there was no justice in that, but when the nerves of that baby's system told in the best language that could tell that there was something wrong, that the milk that baby had that morning did not agree with it, and was doing the best to warn the mother against continuing that very policy, she simply thumped it on the head and knocked it into insensibility by the use of a little morphine. That is the proposition and that is what the food and drugs act is here for, it is to give us an opportunity to exercise our good judgment and our discretion in these matters.

There are many things along these lines we could discuss, but I have not time to discuss any more.

Mr. Cole: I do not know that this question is connected with pure food or not, but I would like to ask Dr. Robinson which has the more feeding value, white dent or yellow dent corn? I have the two varieties and the white dent seems to be the greatest yielder. I would

like to know if there is any difference in the feeding value of the two corns.

Dr. Robinson: I do not think there is any especial difference.

The Chairman: The yellow corn is the best to feed the hens because it will make yellow yolks in the eggs, while the white corn will make white colored yolks. If you furnish eggs to private customers and they notice those things you cannot feed white corn or white wheat to hens. I found that in my experience so thought I would tell you.

The next subject "Should Agriculture be Taught in the Public Schools" will be discussed by Professor Fred Burnette, principal of your schools here. Mr. Burnette certainly needs no introduction to this audience.

## SHOULD AGRICULTURE BE TAUGHT IN THE PUBLIC SCHOOLS?

PROF. FRED BURNETTE, SALEM.

Mr. President, Ladies and Gentlemen:

As each hour has its duties and each position of the world's axis has its seasonable work, so each decade brings up for solution its own problems. Our country has successfully taken up one after another such practical questions as self-government, freedom of speech, the freeing of a race of slaves, and the curbing of dominating capital.

In education the first forward movement was to secure private schools, then came the movement for free primary schools. The establishment of academies and colleges followed, to be in turn succeeded by a movement to establish free city high schools and normal schools; also state colleges and universities. Each of these types of schools has been devised to form a wheel in the educational machinery which we as a people are gradually perfecting.

The educational philosophy of the older church-governed schools which long ruled our educational policy has been powerfully modified by research in the sciences and by development in the industries, arts, and professions. The curriculum once confined to classical learning has broadened out so as to cover the practical as well as the theoretical and aesthetic. Some of our very best philosophy of education is now found in the minds of those teachers who are successfully reducing to pedagogic form and meaning into our educational scheme the essentials of education in the industries and home making.

When the older philosophy met the problems of technical education it said, "Educate the man first and the specialist afterwards." That plan limited technical education to college men. It was aristocracy of education for the few in the professions. If that philosophy had been persisted in, it would have been most un-American.

The persistency with which this mistaken policy was pursued, was due almost wholly to the fact that school teachers cling most tenaciously

to the educational philosophy of the schools where they were taught. Among the intolerant things done in American life stands out the persistency with which our educators go into a new community and disregard the local interests, important and dear to the parents and pupils, placing the school emphasis too nearly all on the remote, failing to give the youth information about the things with which he or she must deal. But far worse, this course tends actually to rob the pupil of his or her inspiration for the practical affairs of the home, the farm, the shop, or other work in which at least 90 per cent must engage.

The broader plans coming into our schools have been largely thrust upon the school men by men of affairs, as in our cities and by legislators. The congress of the United States, by passing the land-grant act of 1862 establishing state colleges of agriculture and the mechanic arts, did more than all other agencies to broaden the philosophy adhered to by the older schools. At first the mechanic arts were brought to a pedagogic basis; then agriculture slowly but surely was brought to a teachable form and last successfully placed into the domain of the school.

The teaching of improved methods of agriculture to the masses of our agricultural youth has recently been advocated by the President of the United States, the Secretary of Agriculture, the president of the University of Virginia, the superintendent of schools of New York city, and by such bodies as the National Educational Association, the National Grange, and the National Irrigation Congress. This may fairly be taken as a sure indication that the discussion of this subject has become very wide-spread, and that public opinion is becoming crystalized in favor of using the schools for the dissemination of agricultural knowledge.

A great awakening to the tremendous issues which are involved in the permanent prosperity of our agriculture and in the maintenance of a high level of intelligence among our agricultural people has come, and happily the minds of our most influential men are turning more and more to the public schools as the fittest and best centers from which to spread a knowledge of the principles of agriculture and in which to inculcate a love of country life and an appreciation of the dignity of agricultural pursuits.

It is a new and serious sense of the real importance of the farmer to the commonwealth, and a fear of the perils into which the crowding of our population in great cities and the neglect to maintain the fertility of our soil are sure to bring us, that are leading thoughtful men of all classes to pay earnest attention to the educational needs of our rural population. It is now possible to secure a fair hearing of the claims of agriculture to a place in our schools and a thorough testing of plans for the teaching of this subject in a wide and effective way. It becomes important, therefore, to look more closely at some of the methods which are being pursued to acquaint our farmers, educators and legislators with the needs of the rural schools.

Investigation shows that in the farmers' organizations throughout the country, the introduction of agricultural instruction into the schools is being actively discussed and warmly approved. Local organizations are passing this question up to the state organizations and these in

turn are sending it on to the National organizations; committees on legislation are being appointed, and there are many evidences of an earnest and persistent effort to secure definite results. A remarkable change has taken place in the attitude of school officers and teachers regarding nature study and elementary agriculture as school subjects. A few years ago it was unusual to find any subject relating to agriculture in public schools or in the programmes of teachers' meetings. Now scarcely an educational meeting of importance is held anywhere in the United States without at least one paper on some phase of this subject.

Steady progress is being made in securing legislation favorable to the teaching of agriculture in public schools. The laws of over thirty states now permit or require such instruction. Among the states which requires the teaching of agriculture in all elementary schools are: Alabama, Georgia, Louisiana, Maine, Maryland, Mississippi, North Carolina, South Carolina, South Dakota and Wisconsin. Legislation on this subject is commonly accompanied with provisions making agriculture one of the subjects on which teachers may or must be examined. In Nebraska for example, candidates for first and second grade county certificates must pass an examination in the elements of agriculture.

One of the objections often made to the introduction of agriculture into our schools, is that the teachers do not know what should be taught under this head. This may have been a valid excuse in the past, but today is no longer so. While there is still much difference of opinion as to details, the general scheme of instruction has been pretty well worked out. For instance, several of our leading agricultural colleges have prepared an outline for instruction of agriculture for the use of teachers in the public schools. In this outline it is recommended that agriculture be taught during the eighth year, and that nature study be given in all grades through general exercises and in connection with language lessons, geography, reading, and history. The outline is divided into three parts. (1.) Agriculture, including the soil, soil enrichment, the plant, plant enemies, rotation of crops, selection of seeds and the farm garden; (2.) Farm animals, including care and feeding, type farms and farm economics; and (3.) Farm poultry.

Realizing that a vital point in the effective teaching of agriculture in our public schools, is the training of teachers in this subject, the friends of this movement are now making active efforts to establish agricultural courses for teachers in our colleges and Normal schools. The agricultural colleges in a number of states have given instruction to considerable numbers of teachers at summer schools. They are now beginning to establish regular courses, provisions for such work having recently been made at the colleges in Illinois, Mississippi, Massachusetts, Michigan, Missouri and New York.

Having now reviewed the progress which has been made in recent years in opening the way for the teaching of agriculture in our public schools, it may be well to give brief attention to the practicalness of agriculture in the public schools, and some of the ways in which farmers themselves may further promote the improvement of the rural schools.

With reference to nature study and agriculture in the public schools, then, the question is not so much one of desirability as of feasibility.

Is it practicable, considering the present condition of country schools, to teach this subject? Many writers and speakers are ready to say no, and produce evidence and elaborate arguments in support of their contention. In my opinion the introduction of agriculture into our public schools is in the same category as was the adoption of the steam engine, the self binder, and the sewing machine. The vast expenditures of these mechanical inventions would have seemed more appalling fifty years ago than would now the added cost of agricultural education.

Our agricultural communities have never been so prosperous as today. The farmers now have means to improve not only their lands but also their general social conditions. The experience of the past century has shown that a thorough and effective school system is a most influential factor in promoting material wealth, as well as a broad and satisfactory life. Our farmers will be wise, therefore, if they use a portion of their increased means to strengthen and improve the rural schools.

Better trained teachers, improved school houses and grounds, more apparatus and books, free transportation of pupils to consolidated schools, and the teaching of agriculture will cost something, and if they are to be had they must be paid for. But unless all past experience is a false guide, this improved school system will be one of the most profitable investments ever made by a civilized community. And if our farmers are alert to their interests they will push these improvements along rapidly and they will not permit the entire expense to come out of the taxable farm property. The villages and cities, whose prosperity rests on the farms, and the accumulated wealth of the state should contribute to the education of the rural people.

The farmers can also do a great deal to promote the teaching of agriculture in the rural schools by encouraging the teachers to take up this subject and to prepare themselves to give instruction in it. The farmers are very largely the managers of the rural schools and their children are the teachers in them. Merely by taking an active interest in the local schools, inviting the teachers and scholars to visit the farm, especially when there are unusually good crops and fine animals to be seen there, or sending specimens of products or injurious birds or insects to the school, the intelligent farmer may help to create a sentiment in favor of agricultural instruction.

It is universally admitted that adaptitudes are developed, tastes acquired, life habits formed during the years that a child is in the public school. Hence during these important years, every child intended for the farm should be taught to know and love nature, should be led to form habits of observation, and should be required to begin a study of those great laws upon which agriculture is based. Most boys and girls reared on the farm get no educational training except that given in the public schools. If then, the truths that unlock the doors of nature are not taught in the public schools, "Nature and nature's laws will always be hid in night" to a majority of our bread winners. They must still in ignorance and helpless drudgery tear their bread from a reluctant soil.

What is now being done, with all its imperfections, is very important. Every successful example of the effective teaching of agriculture, whether in a little country school or in the agricultural high school,

is helping to indicate along what line the future growth of this movement must proceed. There is therefore much cause for congratulation that in so many different states and under such a variety of conditions honest and substantial efforts are being made to solve the problems of our rural schools and to test the usefulness of agricultural instruction as a means of improving country life and perpetuating agricultural prosperity.

#### DISCUSSION.

The Chairman: That was a most excellent paper, the best on the subject that I ever heard. The review of the course of the idea which leads up to industrial education is brought out there very plainly. I wish the professor had given his opinion a little more of the practical working of it. However, that would be more theory than anything else because the working of it to this time has not been carried out very much. I would like to have that paper discussed. I would like to hear the opinion of the farmers in this vicinity as to the desirability and practicability of introducing elementary agriculture in the district school. Mr. Hunter what do you think of it?

Mr. Hunter: Mr. President, I think it would be a very excellent thing. I do not believe there is any subject it is easier to understand in general than those things which surround us from the very beginning. The best of educators tell us we learn more out of school than we do in, no matter how young we are. Unconsciously from the time we begin to think we are bound to learn, and as the professor well said it seems to me that the proper time for the country child to begin is to be taught rationally there right in the surroundings in which he is born. I was very much pleased to have our president commend the excellent paper because it is certainly an important subject and one which in the future will have greater progress than it has in the past.

The Chairman: Do you believe that if the boys and girls in the district schools are taught the elements of agriculture, they will be more apt to become farmers?

Mr. Hunter: I think they would perhaps. I do not, however, consider that as important as I do that they will become better citizens, better men and women, and I think they will be better from being taught from the beginning, I think they will learn better to have the beginning of their education connected with their agricultural lives and surroundings. The difficulty is in the children getting the knowledge. We have attempted to teach it as a general subject brought from a distance, as something that has been strange and unreal to them but we should begin to classify the education as it is important where we should begin. There was a time when they all had to learn their A, B, C's until it was found that they knew a cow or a horse better than they did the letters of their own name. I was fortunate in that way; I was not sent to school and I learned to read by the word method before the word method was used. I did not know where all the letters came in until I was afterwards sent to school and had to learn in order to use my dictionary. I learned the alphabet after I learned to use my dictionary, although I could read a year before. Teach the child of his surroundings and he will learn more readily about the things with which he comes in contact every day of his life.

The Chairman: Professor, how would you answer that question? Do you think the study of elementary agriculture by the boys and girls would have a tendency to make them more interested in farming?

Prof. Burnette: To a certain degree. Of course there are a great many changes than will have to be brought about before agriculture will be a success in the public or in the rural school. In the first place, we will have to have consolidated schools, in my opinion. There will have to be a change and the conditions on the farm will have to change somewhat. If the farms are in a prosperous condition, I think it will have a tendency to bring those pupils to the farm.

The Chairman: You think the dollar proposition will decide it after all?

Prof. Burnette: It will to a certain degree, in my opinion.

The Chairman: We farmers are interested in having better farmers and in having the next generation of farmers a great deal better than this. Will agricultural education tend to make better farmers, will it tend to keep the boys and girls that are born and brought up in the country citizens of the country, or will they be just as apt to leave the farm and go to the city in the future as they have done in the past? Mr. Deake, what is your idea?

Mr. Deake: I think it would tend to keep the boys and girls on the farm, because they would become more interested in agriculture right from the start.

Member: I believe this study of agriculture on the farms or in the schools will be of benefit to the farmers, for the reason that we will leave a good impression of agriculture with the child, and if we look about we will find it is hard work to get away from our impressions. I think it is the tendency of the teachers in our rural schools to give the impression to the child that almost anything is better than farming. The children are educated away from the farm, they are led to believe that almost anybody can be a farmer but it takes somebody with a pretty good head to be something else. I think we ought to get away from the idea that almost anybody can be a farmer. It is necessary to have brains to be a farmer as well as anything else and I believe interesting the child in these facts is going to make him more content on the farm and arouse in him an ambition to be a farmer and a good one. I think it will be a benefit not only to the farmer but to the community in general.

Dr. Robinson: I am thoroughly of the opinion that the development of enthusiasm and interest in any line tends to keep the best men working at it, and I feel so sure of the proposition that I know that the introduction of agriculture in the district school will do more towards developing an enthusiasm and interest among the boys and girls that live on the farm and keep them on the farm than anything else we can do.

As the gentleman said a moment ago, it requires a man of more than average intelligence to be a good farmer and when you create that impression among any class of progressive people those people are going to have an ambition to go into that sort of work.

The Chairman: Farming on the virgin soil is a very simple proposition. All you have to do is to plow, sow, reap and mow; but after a country has been farmed for a generation or two and the soil has become

exhausted of much of its fertility and its vegetable matter, the only way we can make the most of farming is as ex-Governor Luce said once, "Mix brains with the soil." We have to do it, and when you get into that condition farming is a more intricate business. You have to know something to be a farmer and make a success of it. It seems to me that a boy who learns something about soil, if it is only from an oral talk, he learns enough to judge that it is necessary to cultivate ground, not only because it kills the weeds but by bringing different particles of earth into different conditions, certain plant food is made available that was not available before, so he can see the reason for this cultivation. It lightens the task and makes him interested in it, while if he does not know anything about this it is drudgery on the farm. Imagine a man running a steam engine all his life and knowing nothing about the philosophy of that engine. I would rather be in states prison than do a job that I do not understand what I am doing. That is what we expect our boys and girls to do on the farm, to go through the physical operation of farming without knowing the philosophy of it. If we could introduce a plain course of agriculture in the schools, if we had teachers who understood those things and would teach them to the boys and girls it would make a vast difference in the agricultural population of this country in the years to come. I feel that must be so.

Mr. Powers: Mr. President, don't you think the impression a child would get from his father, if he was a scientific farmer farming on scientific lines, would teach him more readily than anything he could learn in a school? Of course he might not get the fundamental principles which he would gain at school but at the same time it is natural for the boys when they are small to think their father is a great man and whatever he does must be right. You can see everywhere that boys are following in the footsteps of their fathers. Take it in the new country where I live, the boys up there have not got over the lumbering fever yet. They dress for the work the way their fathers did and are proud of it, they get on their red sox and striped shirts and they think that is the best thing they can do. They follow the example set by their fathers. It seems to me if the father is a good scientific farmer he will have quite an influence on his sons.

The Chairman: Mr. Powers, as was stated in that paper, agriculture has not been in teachable shape until a comparatively short time ago. The average farmer of today never had the opportunity to look into agriculture from the scientific standpoint. He has looked at it from this other standpoint and the boy and girl taught agriculture in the district school or in the high school today is going to have an opportunity to explain some things to his father and mother on the farm. Three or four generations hence your argument will apply very nicely, but not so well today. Anything else along this line?

Mr. Hunter: One of my boys is in that class today and he is keeping me thinking now, asking questions when he comes home and he is asking questions about things that it has taken me a half a life time to find out. I might say further that the average of the general education is high here and what has given me success in my profession was simply the knowledge of where to lay my hands to find what I had to have. We have to have knowledge for success in any profession and of course general education helps us to know where to obtain specific knowledge



so when a boy comes and asks us questions we can answer them, without waiting thirty or forty years to learn by experience.

Mr. Munn: I think if it is going to help the boy grasp the idea that he can get a dollar easier he will stay on the farm.

Member: I think we lose sight of some things in regard to this matter. I think we might better wait until the boys and girls grow up and know what they like to do best, when they get up past the eighth grade they will know whether they want to be farmers or not and then let them go to the agricultural college and finish up as farmers. I think they might better get a good elementary education than to get a smattering of farming.

The Chairman: My dear Sir, when the majority of those boys get up to the eighth grade, instead of going to the agricultural college, they go to the cities to shovel coal and snow in the winter time and to live in unkept places, when they could go on Michigan farms and live like kings and have good homes, and we have to begin with the boy and girl before they reach the eighth grade and get them interested in some of those fundamental things in order to influence them to go to the agricultural college after they get beyond the eighth grade.

Member: I do not think such boys and girls as those would amount to anything anyway.

Member: I believe before we introduce agriculture into the rural schools we will have to introduce it into the high schools and normal schools, because a child will not get much enthusiasm out of a book alone, and a teacher has to understand what she is teaching before she can instruct a child. If it is introduced into the high schools and normal schools, within the next ten years we may have someone to teach it in the rural schools.

The Chairman: Don't you think we have to demand those teachers before we get them? The farmers have to demand that agriculture be taught in the district schools before we get that demand complied with. When we demand those teachers we will get them without trouble.

Member: This question is of great interest to us all and I agree with the professor in what he said, but why is it that the farmers of today are better educated along agricultural lines than they were twenty years ago? It is not because of the rural schools. Agriculture has not been taught in the rural schools. It is because of such meetings as we have tonight. I think we have to look somewhere else for the education.

The Chairman: Yes, but, my dear sir, we only interest the adult in this sort of work, and we want to interest the boys and girls.

Member: If you interest the father and mother the boy will become interested. It is said that "all roads lead to Rome." If we teach the boy to educate himself to make the dollar he will do it, in my opinion, and if we have to leave out some of the elementary branches in order to teach agriculture I doubt the wisdom of the move. I used to hear our professor say that he thought it took a couple of bushels of brains to make a lawyer but he found out it did not take much brains to make a lawyer and few made good lawyers. It takes a good deal of brains to make a good farmer, it takes brains to make a man anything, I do not care where you go. I do not believe in throwing out everything else in the rural schools to make a farmer, neither do I believe in making every-

body a farmer or in choosing a profession for a boy before he is fourteen years old.

The Chairman: We are not advocating that at all.

Mr. Bates: Farming is not exactly in my line of work but Brooker T. Washington's school in Alabama is a wonderful institution. It is an industrial school in which he is trying to educate the colored people in his own class. He shows them how to be good agriculturists, better than they have been. They go back to their little plots of ground and can raise two potatoes where the year before they could only raise one. The white man stretches his neck over the fence and says "How did you do it?" and the colored man replies "We learned to do it at school," and I think that largely answers the question we have been talking about this evening. Whatever will help to make more intelligent farmers in their line of work we need not be afraid of, we need not be afraid to introduce it into the common schools, and we do not need to crowd out anything else. It supplements and adds to and puts a little more on and helps a man to be a more intelligent farmer, and I think it largely solves the question of keeping the boys on the farm.

The Chairman: I think that is a correct conclusion to draw. I do not think we can continue this discussion any longer. It is a question I will admit, I am more interested in than the one about which I am going to speak because I believe it is of greater importance. It is almost ten o'clock and I am not going to say very much on this subject.

## WHAT THE DAIRY AND FOOD DEPARTMENT IS DOING FOR DAIRYING.

MR. COLON C. LILLIE, COOPERSVILLE.

Four years ago, when Governor Warner asked me to become Deputy Dairy and Food Commissioner, he told me that he thought the scope of the dairy and food department ought to be broadened to include dairying. He said, as he understood it, the word "Dairy" in the name of the Dairy and Food Department was a misnomer, it did not mean anything. We had a dairy and food commissioner and yet there was no law authorizing the commissioner of that department to do anything at all for dairying. It treated simply dairy products as food products but there was nothing contemplated in the organization of the department or the statutes which would enable the dairy and food commissioner to attempt to be helpful in building up the dairy industry in Michigan. Governor Warner thought it ought to be done and so he asked for legislation from the legislature of 1905, and he got the legislation, which made it the duty of the dairy and food commissioner to foster and encourage the dairy industry of this state.

As Dr. Robinson has told you, the organization of this department was in 1895 and it was ten years after before the department was broadened to include dairying, but since then that department has been trying to do something to better dairy conditions in the state of Michi-

gan. It was new work and it had to be largely what I might term original work. There were no blazed trees along the trail that we could follow, we had to go and make the blazed trees ourselves in the attempt to improve the dairy conditions in this state.

Now the central idea in organizing this work was to assist the farmer in getting more out of the products which he grew on his farm and fed to the dairy cows. That was the idea. After looking the subject over carefully, it seemed that there was only one thing to do and that was to try and improve the quality of the dairy products. That would help the farmer more than anything else that could be done, would be an attempt to improve the dairy products. Why? Well, when you improve the quality of butter, cheese and milk it enhances their value, they will sell for higher prices, and when you improve the quality of dairy products you increase the consumption of those products, so that a bettered quality of dairy products increases the consumption of those products, broadens the markets for them and also demands a better price.

Some people think they cannot afford to go into dairying, to improve their barns, put money into the building of new barns or fixing up their old ones, make investments in dairy cows, improve their dairy herds, because they believe that just about the time they get things as they want them the price of dairy products will go down and they will not be profitable. Now, my friends, if you better the quality of dairy products sufficiently you never need have any fear about a market for dairy products. If all the butter produced in the state of Michigan today would grade extra there would be a better demand for butter than there is today. When our city cousins and when we ourselves get good butter and spread it on bread we want to spread it pretty thick, but when we get hold of poor butter we spread it lightly or do not spread it at all. It is the same way with cheese; if the cheese is of excellent quality we consume more of it and it takes the place of other foods; and when our cousin down in the city of Detroit takes up a bottle of milk that the milkman left her in the morning and holds it between herself and the light and sees sediment in the bottom of that bottle, she does not use as much milk as she would if she did not see sediment in the bottle, because if she ever had anything to do with agriculture, and a great many of them have come from the farm, she would know what that sediment in the milk was and it would not tickle her palate so much as if it was not there. You can increase the consumption of dairy products by having them better, it creates a better demand for them and enhances their prices.

The question was "How shall we improve the dairy products of this state?" We organized an educational scoring contest for butter and cheese. We tried to get the creameries of this state to send samples of their butter to be scored by an expert market man; we wanted him to criticise the quality of their product and we would send the criticism back to the buttermaker with the idea of helping him in improving the quality. Much good has been done along that line. Some creameries have been benefited only indirectly because they have not patronized the scoring contests, but I do not believe there is a creamery or a cheese factory in this state but has been benefited in one way or

the other from this educational scoring contest. I know of some creameries that have been practically put on their feet by this contest. Their methods have been changed and the quality of their product has been so much bettered that the creamery has been changed from an institution that realized no profit to a profitable one.

Besides this we want to inspect the creameries, we want to be helpful to the buttermakers if we possibly can, and so we employed expert creamery buttermakers, men who had made a success in managing and operating creameries, and sent them around to inspect creameries. Some creameries did not need very much inspection, others were certainly in need of it. We have continued that course and that policy by sending practical buttermakers around to inspect creameries, to get information in many instances, to make reports so that we will know the condition of the creameries and cheese factories throughout the state.

We found when we began this investigation that the real campaign for improving the quality of the dairy products of this state or any other state was really beyond the creamery and the cheese factory, it was down to the producer of milk. It is not very necessary for me to say much along this line because Dr. Robinson talked on this this afternoon, but that is just the proposition that we had to contend with. That was the only conclusion that we could come to, that if we made very material improvement in the quality of the dairy products of this state we had to go out among the farmers and talk with them and reason with them about producing clean milk and sending it to the factory, to the cheese factory and to the shipping station in good condition.

That is why the State Dairymen's Association is interested in coming down here in this dairy community, it is to impress upon you the necessity of looking into the philosophy of this thing; not because we want to interfere with you, not because we want to interfere with your business, but because we want to be helpful, and we know the only way we can be helpful to you is to encourage you to take more pains in the production of milk. That is the whole question right there and that is what we are working for.

Someone has suggested during this meeting that we ought to inspect the dairy farms and ought to make a report that would go to the local factory. I will admit that it would be a fine thing and I believe it would pay the farmers of this state if they had to pay the entire expenses, if they could get a conscientious, earnest young man who understood their business, to visit their dairy farms in this state, make an inspection of them, talk with the owners and impress upon their mind the fact that if they would do this and that in the production of milk that they would get not only a better price for it but they would create a better demand for dairy products. I believe the farmers could afford to pay every bit of the expense of such an investigation. It is so important. The dairy and food department cannot go to every dairy farm in this state, it is impossible, the legislature would not appropriate the department money enough. You people would not stand for a legislature that would appropriate money enough so we could send an inspector to every dairy farm in this state in a year. It would be a great task. If you don't think it is, try to inspect all the dairy farms in Salem township and see how much time it takes.

The Dairy and Food Department realized at once that it could not inspect all the dairy farms in this state with the appropriation it had and so they reasoned "If we can create a demand for dairy meetings, if we can get the farmers enough interested in dairying so they will come together and we can discuss these questions, it will in a large measure take the place of actual farm inspection," and so it has been the duty as well as the pleasure of our department to hold a great number of dairy meetings. This meeting is not held under the auspices of the Dairy and Food Department, it is under the auspices of the State Dairymen's Association, and that association received a small appropriation from the state treasury, about \$500 a year. If it were not for that we could not afford to come down here because no man can afford to give up his own business entirely for the benefit of the public unless he has immense wealth, a poor man cannot do it.

But I am talking about the policy of the Dairy and Food Department to hold, wherever there was a demand, a dairy meeting with the object of getting next to the farmers in that community and encouraging them to produce better milk; not only that, but they have tried to encourage them to produce it more economically. That is practically all there is to dairy farming, is the economical production of a high grade of milk. Now that is what the Dairy and Food Department is attempting to do for dairying in this state, and this, in a brief way, is an outline of the methods being used to accomplish that. It is a subject about which I might talk for a long time, but it is ten o'clock and I thank you for your attention.

We will now stand adjourned until tomorrow morning at 10 o'clock.

## SATURDAY MORNING SESSION.

Meeting called to order at 10 o'clock and opened with a vocal solo by Mrs H. Munn.

The Chairman: The first subject on the program this morning is Co-operative Diarying by Mr. E. S. Powers. I do not know whether you people know Mr. Powers or not. He is a creamery buttermaker and manager, made a success out of making butter and operating a creamery for himself and is well qualified to talk along the lines of cooperative dairying. I have great pleasure in introducing to you Mr. Powers.

## COOPERATIVE DAIRYING.

MR. E. S. POWERS, RAVENA.

Mr. Chairman, Ladies and Gentlemen:

I apprehend that you all understand full well the objects of cooperation. We had that very clearly explained yesterday by Mr. Lillie, in regard to cooperative cow testing associations. The object is the same in all cases and the principles of cooperation have been followed to some extent from time immemorial. There was a measure of cooperation between Adam and Eve, because we can imagine that if Eve did very much in the way of keeping house, making apple pies, etc., Adam had to cooperate and present her with the sugar and fruit, for we know it is rather a lost art for a woman to throw a club well enough to knock an apple from a tree, and it is always that way although it is hard to make a woman believe that.

We can see cooperation in every day life, we can see the benefits of mutual cooperation in the home. We can all cite some instance of a man and his wife starting out life together and working together, and we know it makes quite a material difference between those two how they agreed on certain things, it made a difference in the progress that they made. That is true; it makes quite a difference whether they pull together or whether one pulls one way and the other another way, and the same is true of anything where cooperation should be carried on.

The first cooperation in Michigan among farmers or dairymen was in the establishment of home creameries and you know of the many utter failures of home creameries. I venture to say that eight out of ten of the cooperative creameries that were organized made a success out of the business, were successful in carrying out the business of cooperation. Opinions among the farmers were so divided that there was no unity of work and they did not accomplish what they should have through cooperation. I remember I went into a cooperative creamery in 1901. The creamery was organized by the farmers in the neighbor-

hood and for six or seven years there was no unity of action or harmony among them. There were a number of stockholders that could not agree on any one proposition and the result was that the creamery never prospered, simply existed and paid expenses. At last the climax was reached and something had to be done. There was a debt on the creamery and the stockholders were divided into fractions, one part of them could work together harmoniously but another part of them kept opposing everything that was proposed for the benefit of the creamery, having an idea that certain men in charge of the creamery were defrauding them, and the farmers that kept the smallest number of cows were the ones that were doing the most to create trouble. You can see that such men talking to outsiders had a bad influence on the creamery; it seems strange that a man would invest \$100 in stock in a creamery and then turn around and do somethings that would injure the value of that stock, but that is exactly what some of those farmers did. Well, as I have said, two things went along like that until a time came when something had to be done, there was \$1,400 in debt against the creamery. Those men who had kept up a fusillade of complaints against the creamery wanted to sell it, not seeing that the creamery would not sell for the amount of debts against it, but they wanted to be relieved of it as soon as possible. The farmers that worked harmoniously together simply turned around and organized a company of men that they knew would work in harmony, took hold of that creamery and I am glad to say it is one of the largest cooperative creameries in the state today. The new organization got better machinery, because the old company had been using old style machines scarcely fit to do business the way the other creameries were doing it, they had an old style separator by which they were losing as much as .1 per cent in the skim milk, and that was too much of a loss. From the time the new organization took hold of the business, the creamery prospered right along and last year during the month of June that creamery made somewhere near 70,000 pounds of butter, more I think in that one month than they had previously in the whole six years they had run. That shows what cooperation has done and what it will do for farmers that will organize and work together. The main thing in cooperation is to agree and work together.

I do not want to have you lose any of the enthusiasm that was manifested here yesterday on the cow testing association idea, but cooperative dairying comes right in the same line as the cooperative testing associations that are being formed here in Michigan, and which was discussed so fully yesterday.

There is another thing that goes well with that. Cooperation in dairymen means that the farmer should cooperate with his cows, that is be on friendly terms with his cows, be on terms so that when you go into the barn in the morning you will feel like taking off your hat and saying "Good morning." I heard of a lady in Wisconsin who claimed that the very first thing she did in the morning was to go to the barn and say "Good morning" to the cows, and when she came into the barn they all looked towards her as if they expected she would say that. That lady made a success of dairying. But there is a whole lot in becoming familiar with the cows, getting close to them, so that

we do not have to chase them all around the barnyard to corner them and get our hands on them. We want them to come up to us.

I believe the worst thing a man can do is to go into some business he does not really like. I tell you if a man does not like dairying he had better get out of it as soon as he can because if it is distasteful to him to be among cows he cannot get the greatest amount of good from them. I have a patron of my creamery who has four common cows and by taking care of them as you would of a horse or an animal of that sort he is getting good returns from those four cows. In 1907, one was a two-year-old heifer too, he received \$276. This winter he is receiving about \$40 a month from his four cows, and they are just average cows. I heard Professor Haecker say once that he believed profit in dairying was a great deal more in the dairyman than in the cows, because in Wisconsin and Minnesota they selected a number of cows through the country, picked them up promiscuously, of different breeds, and through systematic feeding and care there were not many of those cows but proved to be profitable animals. On the average through the state of Michigan the cows are not paying what they should, we are not getting as much from them as we should and in many cases I believe the trouble is that the farmers are not feeding them properly, and those same cows would prove to be profitable if a little more care and attention were given to them in feeding and stabling them and making the cows as comfortable as possible, making the conditions surrounding them in the winter as nearly like summer as is possible.

There is another cooperative system that is going to do the dairymen of Michigan, I believe, as much good if not more than any other one thing that has been started recently, and that is these breeders organizations which are being carried on by the Agricultural College. The college is sending out men organizing breeding associations. I know we have a number in our community and there is no question but good results will be obtained from that cooperation among the dairymen. I presume you all understand their method. They send a man into a community to find out from the different dairymen what breed of stock they really want, whether the Holstein, Jersey, Guernsey or Ayrshire. They try to get a bunch of farmers that are united on one breed of animals so they buy three sires for one group of men. That group of men uses those three sires and every two years they change those sires around so that makes a continual change right there, at the same time saving the expense of sending away and getting new sires. I believe that is one thing that is going to do a whole lot for the farmers.

Another feature of cooperation that I believe has done as much for the farmers as any other one thing is these meetings. It is only in recent years that these auxiliary meetings of the Dairymen's Association have been held in different parts of the state. This is the fourth year these meetings have been conducted and there is no question in my mind but they are doing a whole lot of good through the state. I can see the difference in visiting different towns where these meetings have been held. Where there is an organization among the farmers, like the farmers' club, I find the people are becoming better posted on general dairying than in localities where there has been no interest to



have these meetings. It is very noticeable that where these meetings have been held the most frequently there you will find the most up to date dairymen.

In concluding these remarks I wish to say that I believe if you had a cooperative testing association here it would be one of the best things you could have to get the farmers together and exchange different ideas on the subject. An association of that kind creates a warm feeling among the members. We are working for one interest and I do not believe there is one thing that will stimulate and keep up the enthusiasm for profitable dairying like a good dairy meeting of that character.

I do not know that I can say anything more this morning that will be of interest to you. I am sure you will derive more benefit from this subject by the questions you ask.

The Chairman: Mr. William Hamilton is on the program to lead in the discussion of this subject.

## DISCUSSION.

WILL HAMILTON, SALEM.

Mr. President, Ladies and Gentlemen:

This subject of cooperative dairying naturally is very interesting. Cooperation, Webster says, means working together to accomplish one end, and I think this in dairying means a more pleasant and profitable business. We are naturally in the business for profit and I believe we should be in it for pleasure, to a certain extent. If there is no pleasure in a business we had better get out of it.

From what we have heard of this subject it seems to be best to organize to accomplish cooperation in the best way. I think the most profitable of these organizations is the cow testing association that has been so well discussed here. A little while ago I had some trouble or thought I had some trouble with the test I was getting at the creamery. At the National Dairy Show one of the smooth tongued salesmen sold me a tester and I brought it home and thought I would show my creamery man something. I did not tell him anything about it but in a few days I was there, and some of my neighbors had told him I had a tester and he had better look out. He said to me "Well, I hear you have a tester." I said "Yes," and I thought I had lost him as a friend but he said "I am glad of it." I thought that man must be crazy to be glad I got a tester. He said "I wish all the patrons had testers, there would be less kicking." The fact is when I commenced to use that tester I stopped kicking about my test. I think that explains a matter that was brought up here yesterday about bringing the tester to time with the cooperative cow testing association. I do not think there would be much trouble that way.

One part of this operation that the speaker did not mention that I think is worth thinking about is cooperating with your men on the dairy farms. I had the pleasure this summer of working on a large

dairy farm where there were over one hundred cattle kept, about fifty milk cows, and the owners of that farm did not believe in co-operating with their help at all. I never saw the owner of the farm but twice. He had a manager but the farther the manager could keep away from that dairy barn the better he liked it, he did not like it as much as he did farming. The first week he told me I was to have charge of things there that the owner did not like to be troubled with things in the dairy barn, he was too busy to be troubled, so they left it with me. I did not know anything about the past records of the herd or what they could do. I soon found out there were cows there that ought to be milking a couple of months that were only giving a couple of pounds to the milking. They were using the milking machines, perhaps they were responsible for it. I don't know. But I think if the farmers would co-operate with their help a little more, treat them as men, it would be valuable co-operation. I do not know that I can say anything more on this subject.

The Chairman: This subject is now open for general discussion. We will be glad to hear from any one. It is quite a broad subject and a very interesting one. Mr. Deake have you a word to say?

Mr. Deake: There was one point not brought out that I was hoping would be, that was in regard to the creameries and milk dealers in general co-operating. There is a great deal of trouble along that line today through different creameries trying to put each other out of business, trying to draw from each other. That feeling should not exist. There is room today for every creamery that we have to exist and get a good supply of milk if they will only co-operate. They can all get all the milk they can handle but they are not trying to do that so much as they are to draw from each other. It seems to me if they will quit that and let the other fellow alone there will not be one half as much trouble, and if they would encourage this co-operation among their own patrons, encouraging them to produce more milk, I believe we could increase the production of the cows right here over one third, and that certainly would be a great profit to everybody. It seems to me that this co-operation is a broad thing and it is something we ought to study and practice more than we do.

Mr. Powers: I did not speak about co-operation among creameries because we have not the creamery men here. If I could only get them into a room somewhere where I could force some of these facts on them, I would like to do it. Of course the creameries are largely to blame for this trouble they have among themselves. They do not co-operate as they should. A farmer will say "If you do not want my cream I will bring it over to the next creamery." The creameries should stick together in such matters as that and not show any partiality. Give everybody a square deal wherever they go, and if one creamery says a man's cream is not good and cannot be used, the other creamery should not take it and that would teach the farmer to take better care of his cream. I do not know how we can get at that unless we can get these creamery men together.

Mr. Cole: It seems to me that I would like to say a word. They were talking last night about the early training of the boys and girls on the farm. I think I read in a paper once of the Italians that they are the greatest musicians in the world and that the children were

taught to play the violin before they could talk, while they were still in the cradle, and I believe this training should be taught in the same way. A man can be eighty or one hundred years old and still be an infant in the dairy business. I never will forget the first experience I ever had in an institute or in a meeting. Colon C. Lillie was one of our main speakers at Petoskey, twelve or fourteen years ago, and he talked to the people there in an intelligent way, but I am sorry to say that I do not believe there were twenty people in that audience of farmers that understood a word he was talking about. I was twenty-five years old and I did not know the meaning of protein or anything along that line. At that time I had five cows in the barn but I did not know anything about feeding. A man by the name of Wallace, one of the wealthiest in the country, who kept a herd of cattle, was in the audience and when his wife got up to speak he left the room and went home saying "She is going to stand in with a lot of those state fools." He called my attention to his barn, a large barn with all the necessities that man needed to make himself an intelligent and profitable farmer. He had a heifer there that had just freshened but did not seem well and he asked me what ailed her. I said "Why she is starving to death," and he said "Well you are in with that pack of fools too are you?" At the meeting this man's wife got up and said "We keep a number of cows and my husband is expecting me to make him more butter and better butter and all he is feeding the cows is rye straw." He did not know any better, he was baling his hay and selling it, thinking he was making his profit there, selling his farm off a load at a time. He did not know how to feed a cow and neither did I. I sat down and wrote to the agricultural college to get some information about feeding my cows. I am glad to see a movement of this kind and I think the work ought to be carried along.

Just a word about co-operation, or organization or uniting farmers, or whatever you may call it. I think that point is one of the essential things we ought to discuss. There are a number of ways that we can show our boys and girls on the farm how to make more out of dairy products or out of our farms if we educate them along that line.

Mr. Smith: I am interested in co-operative dairying and organization among the farmers. I was very much interested in Mr. Lillie's talk about cow testing associations. I have been interested in that subject for over two year, since I was at Jackson at the state meeting and I hoped that something of that kind might be done at Salem. We at home have tested our cows and so far as the testing is concerned we know pretty well what our cows are doing, and something about what it costs us but we do not know entirely. I had in mind to tell something of what our private herd of cows had done. In 1907 eighteen cows brought us \$1,623.50, \$90.20 apiece at the creamery for butterfat, nothing else. This does not include the milk or cream we used at home. In 1900 seventeen cows brought us \$1,692.50, lacking \$7 of \$100 apiece. I know we feed better than most people do and for that reason I would like to have a cow testing association and know just what our profits are. I should like to see something of that kind here in Salem.

The Chairman: Has anyone else anything to say on the subject? Of course personally I believe there is not another object so important as this subject of cooperation among the farmers. I believe that the

formation of co-operative business associations among farmers will do more good than anything else that they can possibly do. As Mr. Powers said in his talk, there is too much pulling apart among ourselves. The farmers do not work together like other business men and they lose every time. We seem to be jealous of each other, we do not have confidence in each other in this co-operative creamery business. We elect a man secretary of a creamery and then, instead of helping him and doing all we can to promote the business, some people act as if they wished he was not secretary and they do not support him, and you cannot do as good a business there as if you turned out and supported him and co-operated with him. That is the way other men do in other kinds of business and that is the way the farmers ought to do. The co-operative creamery has done more for the dairy business in Michigan than any other one thing. I have told it many times, but it is only about twenty years ago that we made butter on the farm, took it to Grand Rapids and we could hardly find a market for it in the month of June. I went up there one time with a team to get a load of feed for hogs and brought up five jars of good butter. I went up one street and down the other to find some one to buy that butter, but no one would buy it. Finally I found a man that said if I took it in trade he would buy the butter, so he weighed the butter and wanted to know what I wanted and I took it in granulated sugar. The grocer was mad and said if he had thought I was going to take sugar he would not take the butter. I have seen dairy conditions in this state improve gradually from that time to this, and it is virtually through the co-operative creameries. Why? Because when you co-operate in a neighborhood you produce butter in commercial quantities, you produce butter in such quantities that the railroads will send a refrigerator car there so you can ship your butter to New York, Philadelphia or Boston and get it there in as good condition as it was when it left the station. You cannot do that unless you co-operate. One lone farmer cannot ship his butter to Boston, New York or Philadelphia and if all the people in Michigan would send their butter to Detroit the market would be over supplied and the prices would go away down.

The same way with the manufacture of cheese. You know we used to make cheese on the farm. I have seen my mother make cheese in the summer time. We did not expect to get very much for that cheese. We wanted some for the family and if there was some to spare they sold it for what they could get to the grocer, but today, through co-operation, people put cheese that are not wanted into cold storage and held there until they are wanted.

Why cannot we carry that further, why cannot we carry that idea of cooperation not only along the line of dairying but along the line of other things in farming just as well and get more out of it? We certainly can. For instance, the point that Mr. Powers brought up here about the co-operative breeding associations. There is no question but what the proper thing for the people of this vicinity today in the line of breeding of cows is to first agree upon a breed, not have one man breed Holsteins, another Guernseys and another Jerseys. You can get good herds in this way but you can make more money out of them if you will all agree upon one breed, then stick to it and co-operate. The Holstein breeders in Livingstone county have made more money than any

class of breeders in this state because the whole neighborhood breed Holstein cattle. Not particularly because they breed Holstein cattle but because they breed the same kind of cattle and when they had some to sell there was a car load to sell if a man wanted it and a man might come from California over here in Michigan with the probability that he could get a car load there without going anywhere else. They have done the same thing in Wisconsin, they have done the same with Guernseys and Jerseys. Why cannot the farmers in the state of Michigan act in a sensible business like way about this thing? What difference does it make to a man whether he has Jerseys, Holsteins or Guernseys when you come down to it? There is not much difference in these breeds for dairy purposes. Get together and select the breed you want and everybody breed that kind of cattle. If a man has a large enough herd so he wants to own a sire individually, all right; if not, adopt this plan Professor Shaw has advocated. Through his influence there have been thirteen or fourteen co-operative breeding associations organized through the state in the last year. In that way we can save money because one man does not have to make the entire investment for a dairy sire, and we can use them until they are six or seven years old without sacrificing them. That idea of co-operation can bring the farmer in a large per cent of profit, greater than he is going to get by trying to do things alone. One farmer does not amount to very much I do not care who he is, but if the farmers in a neighborhood band together in a business organization they are a power.

We have other things to sell on the farm. In a locality where potatoes are raised why not have a potato growers' association? What is the use of one man raising one kind of potatoes, another man raising another kind of potatoes, when the two varieties cannot be mixed in the same car without a deduction of five or ten cents a bushel? You might as well all raise the same kind of potatoes and have a secretary that will sell them in carload lots. He will find a buyer can cut out this single man business. The fruit growers in Western Michigan have made great progress along this line in a Fruit Growers' Association. The commission men in Chicago took all the profits in the business while they were individual shippers. The fruit men would ship over there and those Chicago middlemen lived in brown stone houses while the farmers were grubbing along as they did twenty years ago; but now, by the organization of a Fruit Growers' Association, they create their fruit, all the farmers of the vicinity bring it in to one place where it is crated and packed properly and then they ask for buyers, and the buyer tells how much he will give before they sell their fruit. Over at Shelby it has got so, with their local fruit growers association, that people away down at Memphis, Tenn., will write to the secretary of that association to send a car or two of fruit, of such grade of peaches. The buyer does not have to come there before he has done business with that association, and the farmers get a good price for their fruit. One fruit grower up there alone could not do that.

It is the same way with other phases of agriculture, but we have carried it out so we can see what we have accomplished in some phases of dairying. What would our prices be for dairy products in Michigan if we did not have local organizations among the farmers today. How much would the milk dealers in Detroit pay for your milk if you could

not get as much for it made into butter? We have to have organizations.

There are a lot of farmers in this state who are worrying over the fact of cooperative buying. I do not believe there is as much in cooperative buying as cooperative selling and I do not like the principle because it causes dissatisfaction with your town people. You have a dealer here and if, without consulting him, you go out and buy in carload lots, paying cash for the stuff, and feed it out here, you make an enemy of that man and he will "knock" you and "knock" your business. Suppose you organize a cow testing association and have officers and you make up your minds you want a carload of feed of some particular kind. You could go to the dealer and tell him what you want and say "How much will you charge us per ton for a carload of that? We will pay you spot cash for it, or we will pay you cash in thirty days." Fix on the time of payment, then pay at that time so the dealer may depend on you. If he is a good business man he will not charge you much for that, he will do business pretty reasonably, and you can afford to do business with him, and you have made of him your friend rather than your enemy. If he will do the fair thing I would patronize him. Several years ago at Coopersville we could not get cottonseed meal, oil meal and gluten feed in a proper way, the dealer was afraid to take hold of it, he did not like to buy carload lots so the creamery bought in carload lots and sold it out to the patrons. That brought the dealers to time. Now they sell feed on a very small margin, on the same principle as the grocer sells granulated sugar. He does not expect to make a big profit out of granulated sugar, and now the creamery does not have to take care of that. Everbody is satisfied to go to the dealers because they do not charge over a dollar a ton, and it is worth that to do the business and handle it. You cannot expect the dealer will do it for nothing and he ought not do it for no profit at all; he ought to make a reasonable profit. When you are working alone you cannot do those things but when you have the community back of you, you can compel the dealers to do what you want; but in this selling proposition and this breeding proposition, it seems to me the idea of cooperation is the only salvation for greater profits to the farmer. President Roosevelt, when he was down at Lansing at the 50th anniversary of the Agricultural College, brought that idea out very forcibly, and he gave as an illustration the cooperative organization of the Danish farmers. He said it was through those local business cooperative associations the Danish farmer had put himself in position so he could compete in the markets of the world with the products he raises. The American farmers are not organized, they are trying to do things individually and cannot accomplish anything, so the advice of President Roosevelt was for the farmers to organize business associations, not for political principles but for business principles. That is what we are after. Agriculture is a business, we are trying to get a living out of it and we cannot do it unless we give up some of the petty jealousies that exist among farmers in this state and agree to act as other business men do in a business like manner and support each other. It is all right to have difference of opinion on these things, but get together in your organizations, fight these things out and take a vote on these questions and let the majority rule. I have had lots of experience along that line. Our Creamery

board has differences of opinion on certain things. I tried for three or four years to get an ice machine in our creamery and some of the farmers did not take to the idea, thought we could not afford it. I was out voted so I simply said "We will wait," and after a while I got them over to my way of thinking and we bought the machine and now there would not a man think of doing without that ice machine; but you have to fight those things out among yourselves and let the majority rule and then you must all support it. That is the American spirit. We agree in this country to abide by the will of the majority and the minority has no right to protest against the majority doing things the way they want them. Nine times out of ten the cooperative opinion of the majority is better than the minority.

Is there anyone else present who would like to say a word on cooperative dairying? We will now take up this subject of Contagious Abortion in Dairy Cows. I suppose you people down here all know Dr. Marshall, of the Agricultural College. He is one of the men that is putting the M. A. C. to the front today and I have great pleasure in introducing him to this audience.

## CONTAGIOUS ABORTION IN DAIRY COWS.

DR. MARSHALL, MICHIGAN AGRICULTURAL COLLEGE.

Mr. President, Ladies and Gentlemen:

The subject of contagious abortion is becoming a very important one. It would be hard for me to give you an adequate idea of how widely spread this disease is but I suspect it is doing more immediate mischief in cattle than any disease that is prominent among cattle at the present time, including tuberculosis. I suppose it is really causing more loss to farmers who have cattle as their mainstay than any other disease that they are contending with. Now this is quite a broad statement, I realize, but on the other hand I think that we are getting evidence from various quarters that would indicate that such a statement is more or less true.

It is contagious. I may make that statement without any qualification. It is exceedingly contagious and I might say, just the same as I shall say this afternoon, that it is an insidious disease, that it is a disease that lays below the surface for months before you realize what you have, that it may be in the system for several months before you realize that your cattle have the disease, so in that respect it is a very difficult disease to fight.

We did not know very much about the disease, about the nature of the disease until the latter part of the 90's, when a man in Copenhagen discovered the contagion or the germ that causes this disease. He has been working with this disease for the past ten years endeavoring to find some means by which it might be cured, that is he believes that perhaps a remedy would be more satisfactory than a preventive treatment we have indulged in at the present time, so that this disease is be-

coming pretty well known. Bang, who stands as perhaps one of the leading veterinarians of the world and whose word is accepted as entirely the truth in every instance, is a man modest, careful, painstaking, and when he speaks people are ready to accept what he has to say as the best that is available. He found that this disease was exceedingly contagious, he found that this disease was not confined to cattle alone but its greatest efforts exists in cattle. It may be conveyed by direct inoculation, by that I mean that the disease may be injected into an animal and the disease reproduced. That is the best indication that the disease is caused likely by the germs which he isolated. He has also shown that hay or any feed may be responsible for conveying this disease from one animal to the other, so that the food of any character may convey the disease so that when fed it may reproduce the disease after several months. In his experiments he has been able to demonstrate this repeatedly. Even the water supply may be responsible because the animals diseased drinking out of a trough from which other animals secure their water. You can readily see that contagion would be carried from one animal to the other in this way, so that when it comes to fighting this contagion it means that considered effort must be centered upon the stable in the way of disinfection, of thorough disinfection. I shall give you some illustrations before I get through, showing what thorough disinfection means.

Now direct contact of animal with animal has a great deal to do with influencing the spreading of this disease from one animal to the other, from one cow to the other, so an animal that has this disease when associating with other animals may be the carrier of the disease and after several months perhaps you see some of its associates coming down with the disease; so direct association, as well as the stable surroundings, have a great deal to do with the carrying of the disease.

Then again the bull is a great factor in carrying this disease. So important is this animal that Bang in all of his work, in his earlier articles as well as his more recent articles, has emphasized the importance of the bull in the conveying of this disease from one animal to another.

Now I have given you the most important factors in the conveying of this disease from one animal to the other and I want to repeat them so that you will have them clearly in mind,—the stable, direct contact, the bull. Now you can readily see that if an animal is bought from a herd which is afflicted with this disease that it is very easy for that animal to convey it from one herd to another. I think this is perhaps the means of conveying the disease, of spreading it through the state more than any other means we have to contend with because farmers will not acknowledge that they have the disease, and even breeders will not acknowledge that they have the disease; even in the face of making not attempt to eliminate this disease from the herd, they will send animals from their herd and they go helter skelter through the state, going into one herd and another conveying the disease in this way, and consequently we have a great many herds in the state afflicted with contagious abortion and it makes it almost impossible if we have a persistent attack of it, and by persistent attack I mean



one that is difficult to get rid of, to fight it. Sometimes it is just as easily cleaned up as a case of measles in the home but other times it will persist year in and year out.

Now you dairymen, who are attempting to build up herds by selection, by the use of a good sire, can readily see that if you cannot get offspring for building up that herd the process of building up a herd the process of building up a herd is an exceedingly difficult matter. It is discouraging, it is a heavy loss.

In buying animals if you could only assure yourselves in some way that those animals did not have the disease, the cows did not convey the disease, you can see that you are starting in the right direction, and if you could only know in some way that a herd from which you buy an animal is free from the disease, how much more rapidly we would get along in the elimination of this disease, getting rid of it; but at present we have no means of determining because the sellers will not acknowledge the disease and sometimes they are woefully ignorant in the matter, they do not realize they have it.

Now the disease imparts itself largely in the interior lining of the uterus of the cow so it is almost impossible to detect it before you get the fruits of the disease in abortion, it is practically impossible to detect whether the animal has the disease or not; but when you take the afterbirth and examine it you will find it more or less diseased. It is not clean as in a healthy birth, and if you could go deeper and note the condition of the interior linings of the uterus you would be surprised that the cow retained the calf as long as she did, because those interior linings are more or less purulent, containing a yellowish fluid and are greatly swollen, and this diseased condition gradually gives rise to the abortion and consequently the delivery of the calf. That is about all that you will notice. You may, perhaps, a few days before the abortion takes place, notice the spreading of the udder. The cow will have a tendency to make bag and perhaps the genitals will have a sore appearance. You will have some intimation from that source that will give you some knowledge of what is going to happen, but it is not always true. You may have no springing of the udder at all, you may have no indications from the genital and yet have abortion before you know it and nothing can be done. There is no other indication so far as we know. I know there are individuals that say they can tell. At times we can tell, the disease is easily detected from the symptoms which I have given you but occasionally you will have abortion and no indications whatever.

If you have abortion in your herd I can recommend but one thing, so far as the afterbirth is concerned, see that it is buried and all parts disinfected, then begin the treatment of the animal. Usually irrigation of the vaginal tract will be sufficient if the disease has not obtained a very strong foothold. I have seen herds cleaned up with only four or five cows attacked, that is four or five cows have aborted and aborted right along, and the individual go ahead with his disinfectants, disinfecting the stable thoroughly and disinfecting the cows, and abortion would disappear immediately. Again I have seen just as careful pains taken in the disinfection of the animals, the stables and the surroundings, and abortion would stay there for years. How to account for

that we are not in position to say. I remember one place in this state where there were something like three hundred animals. Abortion started in. Just as soon as the owner recognized that abortion had gotten well under way he went in with a disinfectant and practically soaked the stables, barns and implements; he washed the animals thoroughly, he even went into the barnyard and washed the pigs and other animals and simply soaked the barnyard, the stables and cows and everything else and abortion immediately disappeared. I can say that he was fortunate because it does not always disappear in that way, usually it persists for a time. I have heard individuals, veterinarians and others with a limited experience, perhaps, speak of individual cases where they had eliminated the attack very quickly, very successfully, and they think everybody else is going to be in the same position and can eliminate contagious abortion without any serious difficulty. That is wrong, because there are attacks which will persist in spite of everything you do. The germs will crowd along in some way, so that it will take years to get rid of it perhaps, consequently we must not jump at conclusions when we hear someone say that it is an easy matter to get rid of abortion. It may be easy for your herd but it may be exceedingly difficult in some other herds, consequently you have to be more or less charitable.

I do not want to take up too much of your time with this but I want to speak of a system that has been evolved where the disease is quite persistent. If it is just starting in the herd I would not recommend this treatment, but if it has been existing there for some time and seems to be very persistent I should recommend practically the carrying out of most of this. It is the treatment that I feel has given greater satisfaction in many instances than any other, but it means this too, that there is danger in the hands of an individual unless he knows something about the animal, and I will call attention to these points as I go along.

The first is the feeding of carbolic acid. If you ask me whether this has any influence on the disease or not I cannot tell you. It is a remedy that was given out by a lay man in England and he felt that he had cleaned up his herd by the feeding of carbolic acid. It does seem to have some influence. I have talked with veterinarians and professional men, and you know that carbolic acid is sometimes used for contagious diseases, and it does seem to have some influence on the animal economy. That is about all I can tell you regarding the use of carbolic acid. The treatment when you feed: begin by mixing two grams (two grams are about one fifteenth of an ounce) of carbolic acid in a five per cent solution. I say five per cent solution because that is easily handled, and if you say more than five per cent solution you will find the carbolic acid will separate and not be in a thorough solution; and, by the way, when you buy carbolic acid buy the crystalline carbolic acid. If you buy crude carbolic acid perhaps it will do just as well as anything else, but the trouble with crude carbolic acid is that you may get crude carbolic acid that is 15 per cent carbolic acid and you may get it 40 per cent or 50 per cent carbolic acid, consequently you seldom know what you are buying. When you get the crystals you know what you are getting, although of course they are not always absolutely pure. Have the crystals in a body, put the bottle in warm water and let it

stand there and you will notice the crystals will dissolve and become liquid. Now take that material and make up your five per cent solution of water. I do not care whether it is cistern water or hard water, it will answer the purpose. Use that for the material to add to the feed, and allow that to continue for five days. You may think this carbolic acid will have a tendency to poison the cow, but do not be alarmed, you can use fifteen times as much. I have seen much larger amounts used continuously without any apparent effect on the animal. At the end of five days increase the amount to five grams, that is from two grams to five grams, or one sixth of an ounce in five per cent solution. At the end of ten days increase the amount to seven grams, about one quarter of an ounce, and continue this for twenty days feedings. First you measure it out and get your proportions, mix it up with the grain rations. The cows eat it without any trouble, they do not seem to object to it at all. Occasionally one will object some but they will soon come to it. Stop for twenty days, then resume for ten days, continuing in that way. In case of suspects, that is if you notice any trouble anywhere, this dose may be increased to nine grams, that is you can increase from seven grams to nine grams for feeding purposes. In calves reduce to half the amount.

In the case of suspects we resort also to the injection of carbolic acid, so you see we are feeding carbolic acid and injecting carbolic acid. This was recommended by a man by the name of Brouwer. He was not a professional man. This is practically the basis of Roberts treatment for contagious abortion, but you will notice two per cent carbolic acid will cost you just a cent or two and Roberts will cost you something like a dollar a bottle; that is you can buy for a penny or two for what you pay in the case of Roberts remedy a dollar a bottle and perhaps more. I just mention this because some use this method of Roberts and think they get results, and probably they do if they continue its use. It is all prepared ready for use.

In the case of a suspect, inject underneath the skin, with a hyperdermic syringe an ounce of a two per cent solution of carbolic acid every two weeks and where a case seems to be pushing towards the front I should not hesitate using every week. I have seen cases where the carbolic acid injection seemed to just hold the thing in check and sometimes it will disappear. So hidden are many of these symptoms, so hidden is this disease that it is almost impossible to tell whether it is really going to be abortion, and then it is held in check. We simply suspect that the carbolic acid has had its influence and there is a great deal of evidence along this line.

Now we come to a very important feature of the treatment and if we do not feed or inject this should certainly be carried out if we think we have a case of contagious abortion in our herd, and that is vaginal irrigation. I have been in the habit of recommending Lysol for this purpose. Why? Carbolic acid itself may be used but lysol is not quite so much of an irritant as carbolic acid and it has germicidal properties of a larger strength, and that is why we could use it. We could use almost any proportion if we did not get it too strong. You cannot use over one per cent of carbolic acid, perhaps not over three-fourths of one per cent, and if you use some of those other preparations on the market you have to gauge yourselves according to their values, but in

each case some definite recommendation would have to be made. Lysol costs about the same as the crystalline carbolic acid and it is a little stronger, but if you cannot get lysol use carbolic acid. Wash out the vaginal tract with this solution, and this should be done daily in the case of abortion, but in the case of suspects do it at least once or twice each week. The cows will strain considerable; they will strain if you put in plain water, but be careful. I have seen cases where they would run in and puncture the uterus and of course the cow would eventually die. You have to be careful. After abortion the neck of the uterus is open, and to wash out you want to use a rubber top, push it in through the neck of the uterus and wash it out, but if the neck of the uterus is closed so you cannot get in do not go to prying it open. You had better leave it in that condition, but make it a practice to wash out the uterus after abortion at least once each day, with 12 per cent lysol, and a little later I shall recommend something else. If the disease were just starting in a herd, I would use that one-half per cent lysol wash on all animals, whether suspects or not suspects, in the herd once a week. It means business when you get down to fighting this disease. Perhaps some day we shall be able to attack it from another side.

So far as the bull is concerned, the bull should always be disinfected before and after service, and for this purpose I know of nothing better than the one-half per cent lysol solution, using at least two quarts, washing it thoroughly, so that if you remember this fact that the bull is a serious factor in the spreading of the disease you can see how important it is that he be disinfected, and especially is this true if you have a neighborhood bull. You must watch and guard against possible infection from this source.

Now I will deal hurriedly with the treatment of the aborted cows, those that have aborted. Usually the afterbirth has to be removed, then irrigated very thoroughly with a three per cent solution of potassium permanganate. It is usually in the form of round crystalline material. You can get the crystal material and it is not very expensive. The advantage of this potassium permanganate is to clean, it has a cleansing effect. We have used peroxide of hydrogen. You put it into a boil and you know how it cleanses that boil of pus. Permanganate has much the same influence. I doubt if you should use ordinarily a three per cent solution. I would want anywhere from one to three per cent solution, depending on the situation. I would use plenty of this, going away into the uterus and washing out the uterus and vaginal tract very thoroughly with it. After that I would insert the lysol. The permanganate is a cleansing fluid, the lysol follows as a disinfectant, using one-half per cent solution of lysol.

Peters, of Nebraska, the state pathologist, has a capsule which contains a disinfectant. I have used some of those. The principle is this, that he thinks the disinfectant is held back and made more permanent by the use of these capsules. These capsules have to be made up especially and I do not know whether these capsules add anything to the treatment or not. I presume they would cost considerable. I suspect that the lysol with the permanganate does nearly as well even when the capsule is not present.

Any one of these if you use them needs one each day and as the cows grow better just lengthen the periods.

Now for outside washing of the body about the genitals and over the cow, if necessary, use the cheapest disinfectant you can get that will do the best work. Corrosive sublimate, one to one thousand. That is a pound of it, costing a dollar, will make up a thousand pounds of water so you can use it very freely and satisfactorily too. I do not like to use it as an internal disinfectant. I feel that it is not safe to put it away into the uterus for fear that some of it would be retained and thus cause more or less poisoning. You may use this same solution, if you wish, for soaking down the stable, taking a pump and soaking the floor, the sides, the door and the ceiling. There is only one objection to the use of corrosive sublimate for this purpose, wherever it comes in contact with metallic material it has a tendency to corrode it just the same as mercury when you put it on a penny. So I would urge upon you, in using corrosive sublimate one to one thousand, that you keep it away from metals as much as possible, especially instruments if you should have them. You can use for your instruments a lysol or carbolic acid solution and they will have no effect on the metal.

Now all I can say, if you have a tight barn or stable and can use sulphur in addition to soaking it down, use three or four pounds per thousand cubic feet of space, burning the sulphur. Sulphur as a fumigator is one of the best germicidal agents we have. Do not get the notion in your head that formaldehyde can be substituted. We use formaldehyde in houses for one reason because it does not attack metals, it does not discolor and it seems to reach the germs. It is more expensive than sulphur. House fumigation is a different proposition, but when you have stables or anything of that kind and want them disinfected thoroughly, if they are sufficiently tight simply use the sulphur, burning three or four pounds per thousand cubic feet of space, and see while you are doing it that there is sufficient moisture on the floor, sides and ceiling, because the presence of moisture with any fumigant is essential to make effective work. In this way you can disinfect your stable very thoroughly if it is tight. If it is loose, you will have to confine yourself to the use of corrosive sublimate one to one thousand. If you have a piece of ground outside which you want to disinfect, I can recommend nothing better than chloride of lime. You can get a half pound package with directions. It is a strong disinfectant unless you allow it to remain exposed to the air for sometime. Chloride of lime is one of the best disinfectants but we cannot use it in most cases, consequently we cannot recommend it ordinarily, but we can recommend it for the use of stable floors, patches of ground outside, and in this way you will find the chloride of lime will be very effectual.

The Chairman: No one was put down to lead in the discussion of this topic, and as the noon hour has arrived I suggest that we defer the discussion until after dinner. We will be very glad to have you ask Dr. Marshall a great many questions about this and you can also use the question box to bring out the ideas that you want. We will have the question box right after dinner and my idea is that you ought to make use of it very thoroughly because we have a man here that understands this subject, and you may not have such an opportunity right away. This subject was called for so I suspect some people in this vicinity have cattle affected with this disease. We are dismissed until 1:30 this afternoon.

## SATURDAY AFTERNOON SESSION.

Meeting called to order at 1:30 o'clock and opened with music by Miss Ross.

The Chairman: This topic that we had this forenoon by Dr. Marshall is open for discussion. We would be glad to have it discussed, be glad to have you ask the doctor any questions in regard to any particular phase of this disease. I am aware that it is quite a technical subject and many of us are not even prepared to ask questions about it but if you have the disease in your herd you are necessarily very much interested in the subject.

Dr. Marshall: Let me say, Mr. Chairman, should any of you desire an outline of the treatment which I gave you this morning, if you will let me have your names I will see that you get the outline. If you want this printed knowledge we will be very glad to furnish it.

The Chairman: Now is the proper time for the question box and we will distribute blanks on which you may write your questions. While you are preparing your questions and they are being collected, we will take up the next topic "Local Dairy Conditions" by Mr. H. W. Smith.

## LOCAL DAIRY CONDITIONS.

MR. H. W. SMITH, SALEM.

Mr. Chairman, Ladies and Gentlemen:

I think I will begin by asking Mr. Lillie what a dairyman is?

Mr. Lillie: Well he is a pretty hard fellow to define. I would say that a dairyman is a man who keeps from fifteen cows up, raises the roughage for his cows on his farm, and makes a profit out of the business.

Member: Can't you go below fifteen cows?

Mr. Lillie: No, not if he is a dairyman.

Mr. Smith: The point I wish to make on this question is here. In response to our address of welcome, Mr. Lillie said this was an old dairy country but, according to Mr. Lillie's definition we did not have many dairymen in Salem five years ago, we have not many now. Had I answered that question, I would have said "a man who followed dairying as a business." He may farm as an outside line but a man is a farmer when he makes farming the principal business and sometimes put in a little dairying as an outside issue.

The Chairman: You do not differ much from me. A man with less than fifteen cows has farming for a business, he makes a little out of dairying on the side.

Mr. Smith: Five years ago in this town, I think, there were not more

than you could count on the fingers of one hand that we could call dairymen. Dairying was followed by a few around the station here and the milk shipped. We had a creamery here but, unfortunately, that burned down and all that business was closed up, but I think I can show by the figures I have here that in the two places we have taken in nearly \$60,000 worth of dairy products in the last year, while ten years ago probably \$10,000 would cover all that was taken from this town.

Five years ago in the township of Salem there were two silos, today there are twenty. In speaking of the growth in the dairy business, authorities on dairying are all the time advocating the use of thorough bred sires. I did not have time to find out how many thoroughbred sires there were in the township of Salem but I believe today at least one-half the sires in Salem are pure bred. We have a great many in this town. The next aid they have is literature. We have now a great many signers for Hoard's Dairyman, I hope there will be a great many more. People everywhere are interested in the dairy department of the Michigan Farmer and all other dairy literature.

I will say there is one other point I wish to refer to and that is feed. In the last twelve months there have been sold here in Salem twenty car loads of dairy feed. I have been told that there is no other place in the State of Michigan of like size where so much dairy feed has been consumed.

I believe that is all I have to say on this subject and I thank you for your attention.

The Chairman: Mr Powers is to lead in this discussion.

#### DISCUSSION.

Mr. Powers: It was brought out here this forenoon and yesterday in the questions that have been brought up, that the creamery has furnished the farmer a market for his dairy products. There is not very much difference in the different prices that the creameries pay for dairy products in any part of the state, they are just about the same. I do not know that there is any difference, practically, between what the creameries in the western part of the state and the creameries in the eastern part of the state have paid their patrons. Over in the town of Fremont, where they have a cooperative creamery, they have exceedingly poor shipping facilities. They cannot get out on the main line to ship to Detroit or to the eastern markets conveniently as the creameries on this side of the state, but I will venture to say that the creamery over there pays as much as any creamery in the state of Michigan. That shows what cooperation will do. In November, if I remember correctly, 32.5 cents for butterfat. We find many creameries that are not paying quite as much as that, but there is one point I was going to bring up. Why is it that we go into different localities and find conditions different? Over in Tecumseh, in discussing something along this line, the question was asked "How many special bred dairy sires are there in this community?" and one man got up and after thinking for quite a while he said there was a man over at Tipton that had a thoroughbred sire, but that was about the only one they could name in that community. There is something really wrong somewhere. The farmers

must be asleep, they cannot have awakened to the importance of this, or they cannot be interested in the dairy business.

I live in a community where there is one of the best cooperative creameries in the state, but it seems to be almost impossible to arouse any interest in the dairy business there. The farmers live adjacent to a good hay market and it seems to be very difficult for the farmers to break away from their old notion of either lumbering or teaming in the winter and drawing their hay to Muskegon.

I think another cause for this lack of interest in the dairy business is because the farmers do not keep enough cows to really become interested in the dairy business. They do not keep enough to have dairying of any benefit to them, to sort of keep at home and get them interested in the business. If there is money in keeping two or three cows there is certainly money in keeping more, and what is the use of wasting your time with a few cows? You have to feed four or five cows, you have to take just as much care of them, or should, but the trouble is the farmers do not do that. They neglect their cows. Dairying is only a side issue with too many farmers.

Your record here is altogether different than it is at your neighboring town, Tecumseh, I understand in the lower part of Lenawee county the produce more cheese than in any other county in the state, while in the northern part they have been trailing along, doing very little in the dairy business.

I do not know that I can say anything that has not been said before. They used to say not to put too much grease on the wheel because too much was worse than none at all and I am afraid if we get too much of this dairy enthusiasm in here at once it will sort of discourage you. You will have enough to last you a long time if you follow out all the ideas that have been suggested here and I think if you start right with this testing association that you are going to make the biggest improvement in dairy conditions that can be made at the present time.

The Chairman: This subject is open for general discussion. If I remember correctly the question should be "Local Dairy Conditions and How to Improve Them." The printer in some way left off the latter part of the question. Of course Mr. Smith and Mr. Powers intimated how to improve them but I think it will be practical for the local men to further discuss this question: Mr. Munn, what in your opinion will improve local dairy conditions here?

Mr. Munn: I think that was brought out yesterday, by better care of the product and of the sables, as well as in the feeding and handling of the cows.

The Chairman: How are you going to bring that about?

Mr. Munn: Such talks as Dr. Robinson's yesterday will do a lot. These meetings are what will bring about improvement in the quality and improvement of the product and bring us better prices.

Referring to the question of cow testing association, reminds me of when we started our first creamery here. We were getting five or six thousand pounds of milk a day. Mr. Waterman was one of the directors. He said at that time it would only be a few years before butter would not be worth anything. At that time the highest price we got anywhere was 20 cents a pound. Now from the reports of Mr. Smith we are making ten times as much butter as we did then and the price is one-third



higher; but I do not think the improved quality has all to do with that, organization has more to do, that is if one man controlled the product and sold it he would not get that price, but altogether we get it.

Another thing, in favor of cow testing associations, we would know the performance of our cows, and the time is coming when a farmer wants to buy a cow he will ask what that cow is doing, what is her record. Not many farmers are asking for records now in buying cows but they are going to do it in the future. If you can tell a man that your cow gives 10,000 pounds of five per cent milk is not that going to make a difference in price than if she was a 5,000 pound cow with a three per cent test? If we have this cow testing association it will not be many years before every farmer knows just what his cows are doing, and when a buyer wants a cow he will know which his best cows are and fix his price accordingly.

The Chairman: There is no question but that feature of the testing of grade cows properly is one that ought to receive a little emphasis. There is a movement on foot now with the International Consolidated Record Association for the registration of grade cows on performance, and the standard will be fixed at a reasonable amount. For instance, supposing it is fixed at 250 pounds butterfat. A grade cow that is capable of producing 250 pounds of butterfat in a year is eligible to registration, but that does not make her progeny eligible for registration unless on their performance. The idea is that that is going to increase the value of those cows, that they are going to be more valuable for breeding purposes because, as Mr. Munn says, we will know their records and their performance. It is a great deal more sane way to improve dairy cattle to record cows on performance than it is the way the breeding associations are recording cows and cattle today. If a man owns a herd of registered Jersey cows all the progeny are eligible for registration. It does not take performance to make them eligible and that is wrong, but it is a different matter to keep track of the performance. If we have cooperative cow testing associations, where records are kept by disinterested parties, then we have the basis of recording cows on their merits. Once we get that started there is going to be a cast difference in the price of good cows and poor cows. No question about that. Mr. Thompson, what would you say on this subject?

Mr. Thompson: I suppose you know that we have been in the creamery business five years. When we started in some farmers had one cow, some had two, some as high as a dozen. Those times I did not like to milk a cow. I was interested in horses and sheep and thought it quite a task to milk one or two cows, but when we started a creamery I went in with the others. We started a cooperative creamery, and I commenced to buy cows, and I had some sorry experiences in trying to buy cows and I found the old saying true "Where ignorance is bliss 'twere folly to be wise," in regard to cows. I have one of those cows now, but she was so young when we got her that I did not know whether she was good for anything or not, but she is my best cow today. All the rest have gone, I do not know where. I had to start and raise my cows. I have been trying to breed Holsteins and have some very promising heifers. I have weeded out the poorer cows and now have a good herd of cows, and I believe we are very prosperous in our creamery. The only

drawback is the hauling of our milk. We have haulers come from six to eight miles, and some of them have to travel as far as fifteen miles to get their milk there. We have had faithful milk haulers that have stood by us first rate, but at the present time they are demanding a little more wages than they have had in the past, and that is the proposition we are up against at the present time, to devise some way to get each patron to bear his share of the expense of hauling the milk. I think, however, that will solve itself in time.

The Chairman: Anyone else any idea to offer? Mr. Deake I do not like to have to call on you every time.

Mr. Deake: I was going to say that every time the chairman wanted a discussion he called on me. I think if we could get a few more young, enthusiastic persons interested in dairying that we could benefit the conditions. Two weeks ago I was in Ann Arbor. It was a bitter cold morning. I met a young man who said "Wait a minute, I want to tell you what my cows are doing," and I waited because I was interested in cows and glad to hear what he had to say. He was just bubbling over with enthusiasm over what his cows were doing. He is making money out of his cows and is anxious to learn all he can. If we can get a few more such men in the neighborhood we are going to improve local dairy conditions.

Mr. Smith: In speaking of dairy sires, there is one point I want to emphasize a little more, that is that the farmer cannot buy his cows. I have tried it and have no success. It has come to that point where we have to raise our dairy cows whether we want to or not, so I say the only way is for us to keep pure bred dairy sires in our herds. Another question Mr. Munn brought us is about cleanliness. I know Salem is improving, and I think since we have organized our creamery and the dairy business is growing that we have improved wonderfully along that line.

The Chairman: One thing I would suggest is the organization of a Washtenaw County Dairyman's Association. The county have an association which would meet once a quarter or so, and invite Dr. Marshall and other speakers down here once in a while to talk to you, meet together and discuss dairy questions. I do not know of anything that would tend to create better conditions and make improvements than to have the people get together in a local organization and discuss important subjects in regard to their work. It must be helpful to them.

Dr. Marshall: Of course I am a bug man and not a dairyman necessarily, but some years ago I did take a great deal of interest in studying the conditions of dairying in Denmark and Holland, and I want to say just a word or two in regard to what I have discovered. I found those Danes buying rough feed over in America and elsewhere, paying the freight on it over to Denmark, using it to produce milk and making that milk into butter. Now that land over there is not a bit better as a rule, of course lands vary all over, than your land here. There is this to be said in regard to their management. They believe in cooperation, cooperation in creamery work, cheese work, cooperation in milk testing, cooperation in bull, bull societies, cooperation in poultry, cooperation in the hog industry, in bacon. They were a poor country, a very poor country, when they started out and they are one of the richest

countries of their size, the richest country, I think, in the world at the present time.

The Chairman: I do not know that we can take up any more time on this subject. We will now collect the questions for the box, which we will open at once. I want to ask how many in the audience are interested in the organization of a cow testing association? I noticed there was a sentiment in favor of it and I have talked with quite a number here, and I want to say if there is any considerable number that would be in favor of it the Dairy and Food Department will do all it possibly can to assist in its organization. I would like to see all that are interested in the idea hold up their hands. There are nearly enough here now to form a cooperative cow testing association and I will see that a dairy inspector comes here the first of next week to help you organize. You understand the Dairy and Food Department the first year will furnish you with a Babcock tester and all the blanks for this work gratis and we will publish the yearly record after it is completed, and will do all we can to get you a man to do the work.

The Chairman: While the questions are being collected we will have a musical selection by the young ladies chorus.

Song by a chorus of five young ladies very pleasingly rendered.

### QUESTION BOX.

Question No. 1. Will abortion be cured without using any method of exterminating it?

Dr. Marshall: It has been known to pass through a herd and leave it had not return. I do not know why it is unless the cows become immune to the disease. But on the other hand, it frequently exists in a herd for several years.

Mr. Powers: I asked that question. I was born and brought up in quite an extensive dairy country in the state of New York and I noticed at times that some dairy cows would have the disease and the next year be all right, while perhaps the following year it would come back again.

Dr. Marshall: There is probably a short period of immunity produced.

Question No. 2. How shall we raise calves and sell whole milk?

The Chairman: That is an important question to the man selling milk. He wants to raise calves to perpetuate his herd and he sells his milk to the people in Detroit. How is he going to raise those calves without whole milk?

Member: Do not sell all the milk, give the calf enough. I would rather feed my calf whole milk because I do not believe you can make a good calf out of skim milk.

Mr. Cole: If you will come to my barn I will show you three that have had nothing but skim milk, blood meal and oil meal. Every cow I have in the barn has been raised that way. I will show you ten cows and three heifers.

Mr. Smith: Can calves three months old be fed nothing but skim milk and clover hay?

The Chairman: It is not necessary to feed calves whole milk except for a few days, then gradually substitute skim milk for the whole milk. You can give them the fat in linseed meal as a substitute for the fat in the whole milk and you can raise good calves.

The Chairman: Is there anybody here who knows you can raise a calf on whole milk?

Mr. Smith: I can show you as good a calf as there is in this county who has had no whole milk since he was three days old. He has been raised on artificial feed, I do not know just what it was.

Member: If you have a Jersey herd would it pay to keep a Holstein cow for the purpose of raising a calf?

The Chairman: No. As a matter of fact, a man with a Jersey herd does not often sell his milk. It is worth too much to sell at Detroit.

Mr. Munn: They will pay for butterfat.

The Chairman: How much do they pay for butterfat?

Mr. Munn: Two and one-half cents a pint for all over 3 per cent.

The Chairman: Five per cent milk for buttermaking purposes is worth \$1.60 a hundred and you have the skim milk in addition. How much is that worth? For feeding young calves it is worth that much easily. That would make 5 per cent milk worth \$2 a hundred. Do you get that in Detroit for it? To feed the young calves intended for future dairy cows it is worth more than 40 cents a hundred.

Member: I have been selling my skim milk this year for 40 cents a hundred and I believe I got one third less this year than I did last year when I fed it to the calves and hogs.

The Chairman: But we do not seem to help this man. How can we raise calves without milk. I cannot answer him. I have never had any experience because we never sold the whole milk and we had skim milk to feed the calves. I understand people have had good success in raising calves, and fed them milk only the first few days of their lives.

Mr. Munn: We are having that trouble on our farm.

The Chairman: Some of the pioneers fed their calves on hay tea.

Mr. Munn: That is too much bother. How about commercial calf feeds?

The Chairman: Has anybody ever used any of Blackwell's calf feed?

Mr. Smith: The calf I referred to was raised on some sort of commercial feed.

Question No. 3. Is it possible to get an accurate test for an individual cow by taking two samples of milk each month?

The Chairman: We do not claim it is absolutely accurate, but it is a close approximation and near enough for practical purposes.

Question No. 4. Can an ordinary man test milk accurately with the Babcock test?

The Chairman: We will ask Mr. Powers to answer that.

Mr. Powers: I can see no reason why he cannot. Of course it is understood that this milk has to be sampled correctly, and he must understand whether his tests are of the proper strength.

The Chairman: How do you know whether your acids are the proper strength?

Mr. Powers: One way to tell is by the color and also the right acid brings up a nice clear fat without any sediment in the bottom of the

butter fat. I do not think there is anything about the test that would prevent the ordinary man from testing correctly.

Question No. 6. Which is the better hay for dairy feed, June or Alsike clover.

The Chairman: Mr. Smith how would you answer that question?

Mr. Smith: June clover.

Mr. Deake: I do not think there is much difference.

The Chairman: What would you say, Mr. Cole?

Mr. Cole: I do not think there is much difference. I bought \$50 worth of alsike clover this year to feed in preference to feeding my timothy. I asked a number of men if they knew of any difference and a number said they thought alsike clover was better, but they did not know why. I would like to know if there is any difference.

The Chairman: I do not think there is much difference.

Member: If you feed alsike clover to cows they will leave almost one-third of the stalks.

The Chairman: The principal reason for that is you do not cut alsike clover as you ought to. It gets too weedy. If you cut it in the right development they will eat alsike clover clean.

Member: How about alfalfa?

The Chairman: Alfalfa is richer than red or alsike clover, either one.

Question No. 7. Is it profitable for a farmer to sell corn for \$20 a ton and pay from \$25 to \$30 per ton for concentrates, and what class of cows would you suggest for the farmers?

The Chairman: In answer to the first part of the question, under certain conditions it certainly would be profitable and advisable to sell corn but you do not have to sell it for \$20 a ton and buy concentrates at \$25 or \$30. Supposing you have a ration of roughage of clover hay and corn silage. Your clover hay contains the digestible nutrients of food in the right proportion to get economical digestion and assimilation, one pound of protein to about six and a half pound of carbohydrates. According to German feeding experiments that is the right proportion for a cow giving milk. You feed corn silage, there is a wider ration; there we have carbohydrates and protein one to twelve. We want to feed both of those. When we feed corn silage with clover hay we throw our ration out of balance, we have too much carbohydrates there and it is too bulky. The cow cannot eat enough of corn silage and clover hay. She has not capacity enough to consume that to get food nutrients to do her best, so we want a grain ration to balance up this ration of clover hay and corn silage. Evidently we have to have a concentrated feed richer in protein than clover hay, that has a narrow nutritive ration. You cannot balance that ration by feeding corn meal, that is like carrying coals to Newcastle and they have all the coal they want in Newcastle, and you have all the carbohydrates. You have got to have some concentrated feed richer in protein than clover hay in order to balance up the carbohydrates in your corn silage. What will it be? Pea meal. You can raise the peas on your own farm. Pea meal is rich in protein and with it you can balance the ration. If you do not raise it, it will pay you to sell your corn and buy gluten meal, gluten feed, oil meal, cottonseed meal, any by product rich in protein. A ton

of cottonseed meal is worth as much to balance up a ration of clover hay and corn silage as four tons of corn meal a ton of cottonseed meal has 40 per cent protein and corn meal has only 9 or 10 per cent. Now you can afford under those conditions to sell corn and buy cottonseed meal, oil meal or gluten meal. There is no question about it.

What kind of cows shall the dairymen buy? You are not going to get me into that question. I will say keep a special purpose dairy cow. Select either Jerseys, Guernseys, Holsteins or Ayrshires. Those are special purpose dairy cows, cows that have been bred and selected for generations to consume large quantities of feed which we grow on our farms and convert that feed into milk; then there is another class of cows that have been bred for generations to consume large quantities of this feed and, instead of putting it into the milk pail to put it into choice cuts of meat on her back, so pin your faith to a special purpose cow and you will not make much of any mistake. I do not think, speaking generally, that there is very much difference in the dairy breeds. Some men say "If you want to send your milk to a cheese factory have Holstein cows, if you send your milk to the city you want Holstein cows." Why, my friends, the Jersey cows at the St. Louis exposition produced milk within four cents a pound as cheap as the Holstein and they put 2 per cent more butterfat in their milk. When you produce milk by the hundred you will not make so much more milk out of the Holsteins as you think you will. The best Holstein cow at St. Louis made .56 of a pound more than the best Jersey in a certain time, but it cost more than \$5 worth more to feed it. If you organize a cow testing association here you will keep economical producers, not necessarily big producers, but you will keep the cows that make you the most money and you will find they will not be Holsteins either, whether you sell your milk to a cheese factory or make it into butter.

Question No. 8. How much land would a man need to support a herd of fifteen cows?

The Chairman: That depends upon the man and upon the land but it depends more upon the man than it does upon the land. Rev. Dederich, a broken down minister, who left the pulpit on account of his health, bought fifteen acres of land near the city of Philadelphia and went into dairying. Two acres were covered with buildings, houses, etc. He gradually built up the crop producing power of those thirteen acres so that in 1903 he produced enough roughage (not grain) on thirteen acres to maintain thirty-four head of live stock, seventeen head of which were milk cows, and he had hay to sell. Now that is what a preacher can do when he goes to farming. When you ask me how many acres of land it is necessary to have to keep fifteen cows, I cannot answer you with any degree of satisfaction at all. It all depends on the man. Nobody knows the limit. Dederich did not even find the limit. Of course you would have to define that question. If you are going to raise the grain on that farm as well as the roughage, that would be an entirely different proposition. Mr. Dederich did not raise the grain because he thought he could not afford to, so he bought the grain and raised the roughage, and those were the results that he obtained. I have said before that on a forty acre farm a man ought to keep ten cows, on an eighty acre farm he ought to keep twenty or twenty-five. On one hun-

dred acres a man ought to keep thirty or forty cows. He could start in with a smaller number than that and he could gradually keep increasing the herd.

Mr. Bates: Can we in Michigan raise alfalfa successfully?

The Chairman: I do not know. We had a very nice discussion on the subject the other day at Tecumseh. An old gentleman, Mr. Mills, read a very valuable paper on that subject. He gave instances down there where people had much success in growing alfalfa. I happen to know Mr. Probert of Jackson and he claims he raises alfalfa with great success. His soil is rather an upland, dry sandy soil with a deep sub-soil.

Mr. Bates: I have raised it on clay soil.

The Chairman: Some people claim it does fully as well on clay soil. It is fighting its way inch by inch into Michigan. There have been many failures but probably a number of failures come from the fact that the people have not inoculated the soil with the right kind of bacteria for alfalfa; Professor Smith, of the Agricultural College, who had given this subject quite a lot of attention and investigation when here, said not more than a year ago that he considers alfalfa in Michigan still in the experimental stage. I heard Professor Shaw the other day at Tecumseh say practically the same thing, so the only thing a conservative man can do is to try it on a small scale to see what it will do.

We will now have to take up the next subject "Tuberculosis, Its Cure, Prevention and Treatment" by Dr. Marshall.

## TUBERCULOSIS, ITS CURE, PREVENTION AND TREATMENT.

DR. MARSHALL, M. A. C., LANSING.

Mr. Chairman, Ladies and Gentlemen:

We have heard a great deal about tuberculosis and we know more or less about it. It is called the "White Plague," and I suppose that we will hear a great deal more about it in the next few years because men and women are organizing for a campaign against this disease, both in the human family and in the bovine family. In the human family we have it appearing in the form of consumption, scrofula, and various other forms, so that we have in one way and another come in contact with it. In the bovine family we have it appearing simply as tuberculosis in cattle and, of course, when you come to consider tuberculosis in dairy cattle, we find that it exists in various forms there also.

I will not say anything about the existence of tuberculosis in fowls or other animals but I might add this, that tuberculosis is a disease that is common to nearly all animals, even away down the line. The existence of tuberculosis is something in which we are especially interested. How widely is it spreading among the human family, how widely among the bovine family?

In order to get this question before you in an intelligible light and one which will bear weight, I am going to quote you from some statistics

and I hope that these statistics will not in any sense be dry. Professor Fisher, of Yale, in studying the existence of tuberculosis among humans in the United States from the statistical reports, concludes that 164 individuals out of every one hundred thousand die of tuberculosis annually. This would make 138,000 people, humans, dying in the United States yearly from tuberculosis. Based upon these figures, he claims that five millions of people now in the United States will die of tuberculosis. The cost of the United States, according to his estimates, amounts to \$1,100,000,000 per year. He estimates this upon an estimate of the value of each individual, placing the earning capacity of the individual at \$8 for his life, and he claims that the cost for tuberculosis does not fall upon tubercular individuals alone, but \$440,000,000 of this \$1,100,000,000 falls upon others than those who are tubercular.

Wilcox, of Cornell University, says that 16,574 persons died of tuberculosis in New York state in 1907, and he estimates the cost to New-York state at \$52,251 plus for New York state. Henderson, of Chicago University, says the loss to New York city alone, remember you, is \$23,000,000; that of Illinois \$36,000,000 and of the entire United States \$320,000,000. You see the figures are below those of Fisher but all these estimates are based on different data. Some people will estimate in one way and some in another. I brought out these figures to show you the mortality from tuberculosis in human families alone. This does not mean or does not include all of those who are tubercular. It means those who will die from Tuberculosis. I think, perhaps, it would be safe to say that one out of every nine has tuberculosis sometime in his life. There are those who will claim that every human sometime during his life has tuberculosis. Now you see this puts a different aspect on the situation, that everyone of us sometime during our life has tuberculosis and recovers from it.

In order to show the intimacy existing between human and bovine tuberculosis, I want to call your attention to the work of Hess of New York city, who examined 107 specimens of milk taken miscellaneously from the city supply of different cities. Out of the 107 samples he found that 16 or 17 per cent contained tubercular germs capable of reproducing tuberculosis. Sixteen or 17 per cent, and out of eight samples of pasteurized milk he found one containing the germs capable of producing tuberculosis. This indicates that the pasteurization practiced is not satisfactory. At this point I might emphasize the fact it has been said that the milk taken to creameries and cheese factories has been the means of spreading tuberculosis, through it distribution of skim milk on one hand and whey on the other. So important is this fact that Denmark, taking the lead, instituted a law as far back as 1897 requiring that all milk from the creameries and whey from the cheese factories be pasteurized before being returned to the farms in order to prevent the possible spreading of disease. Now I might say that several estates have enacted a similar law. There is so much evidence of this kind. For instance, one herd in a creamery district becomes infected, the milk is taken to the creamery, the skim milk is sent out through the entire district so that several herds become infected very soon afterwards. Several instances of this kind have been placed upon record and it is a very important point.



There is another way of scattering tuberculosis, and perhaps that accounts for the appearance of tubercular germs in milk. Shredder, of the Bureau of Animal Industry has shown that at least  $41\frac{1}{3}$  per cent of the fecal matter from tubercular animals contains the germs and we all know that practically all milk contains more or less of this fecal matter. It is not a very happy thought but it is a fact.

Now as to the prominence of tuberculosis among cattle. Melvin, Chief of the Bureau of Animal Industry, relying upon the statistics gained from federal inspection of 53,973 plue animals, claims that .9 of 1 per cent or the adult cattle are tubercular; .02 per cent of the calves and 2 per cent of the swine are infected with tuberculosis. Of four hundred thousand cattle tested with tuberculin, manufactured in the Bureau of Animal Industry, we find thirty-seven thousand reactions, a percentage of 9.25. Based upon such data as are available to him, he claims that 10 per cent of milk cows, 1 per cent of all the other cattle and 2 per cent of hogs throughout the United States, taken from an average have tuberculosis. He places the average for cattle alone at 3.5 per cent, in other words he would say that of all the cattle in the United States 3.5 per cent are tubercular. He estimates the food loss from tubercular animals at fourteen million dollars annually in the United States.

Ward, of Berkley, California, who tested milk cows in the city of San Francisco, found 8-10ths tubercular. Reynolds, of the Live Stock Commission of Minnesota, testing the registered cattle of Minnesota, something like sixteen hundred, as I remember it, found 36.8 per cent tuberculosis, and of the grades 7.7 per cent. Russell gives the following table, of which I will just give you the percentages in Wisconsin:

- In 1901 they found 19 per cent.
- In 1902 they found 13 per cent.
- In 1903 they found 2 per cent.
- In 1904 they found 6 per cent.
- In 1905 they found 6 per cent.
- In 1906 they found 12 per cent.
- In 1907 they found 4 per cent.

That represents the work for that time by the experiment station.

In Massachusetts, testing herds at the request of the owners, it was found that  $35\frac{1}{2}$  of those herds were tuberculous; in Maine, out of 935 pure bred animals tested by the state,  $20\frac{1}{3}$  per cent were tuberculosis. These figures I am sure are sufficient to enable one to gather some idea of the prevalence of tuberculosis as it exists in the United States. I think that these figures will give you quite an idea because they come from various parts and portions of the United States.

Now Just a word here about the transmission of bovine tuberculosis to humans. You have heard probably a great deal about this, but it is nothing more than this. We can imagine that a plant becomes well adapted to its environments after it has been going along for a time and has begun to thrive under certain climatic conditions. If you try to transplant that to some other portion of the globe where the climatic conditions and environment are quite different, that plant does not do well, so we probably have on the one extreme the human type of the

germ and on the other extreme the bovine type of the germ; but recent studies have determined that we have all grades between, and further that you can transfer one type into the other type, so that while adults may not be greatly alarmed by tubercular germs in milk, it is in the young children that we find the cause of alarm because they are so susceptible to every agent of that kind, and evidence would go to suggest the fact that quite a number of them possess bovine tuberculosis. It is getting so, and I hope that the work will prove so, that we can detect whether the tuberculosis that exists in a child or in a human of any kind is of bovine source or human source, and when we are convinced that the work is correct you can see that is is going to be a great aid to us in determining whether the individual has contracted the disease from the bovine source or the human source.

Now a word about the tuberculin test. I do not know of any better evidence for the tuberculin test than that offered by Melvin. Melvin says that out of four hundred thousand animals tested the reaction proved to be correct in 98.8 per cent of cases. I do not believe that we can imagine any other diagnostic agent that will compare with this; so far as the reliability of the tuberculin test is concerned, I think we can almost depend upon it as accurate. There are a great many factors entering in which makes it almost impossible to venture to practice in a sufficiently definite form in order to interpret the results as you would like; but so far as affecting the milk flow is concerned, or affecting the animal in any way, there is no danger.

If animals are tested in a neighborhood it costs about fifty cents per head to use the tuberculin test, and if the tester were doing the disinfecting for the people it would cost about \$1.00 per head, so that gives you some idea of the cost of the use of tuberculin and also the cost of disinfection.

Now I am going to offer some figures that will, I have no doubt, interest you. According to Reynolds, Wisconsin paid \$60,000 for condemned animals during the year 1907-8. They tested during the year 40,993. Two thousand three hundred thirty-four reacted under the test. It must have cost a total amount of \$70,000 to test 40,993 animals. Now, as compared with the total number of animals in the State, which Reynolds places at 3, 240,000 they will have tested at a cost of \$70,000 a trifle over one per cent of the animals of the state.

Here are actual figures on Minnesota. Minnesota tested 1,329 registered animals and 25,887 grade animals. That made in the neighborhood of 28,000 animals. It cost the state of Minnesota \$65,000 and if you figure this out you will find that they tested less than one per cent, about nine tenths of one per cent of the animals of Minnesota every year. When I say testing I mean a single test. Do not think you can eradicate tuberculosis from any herd by a single test. It probably means that you must test once, six months afterwards again if you have the disease, and every six months after for three years at least, then probably annually for another period of five years or more. The figures that I am giving you represent a single test only. If we are going to be effectual in this work at all we must be in position to follow it up, otherwise a herd that is afflicted at all simply reverts to its former condition in a few years. Pennsylvania in 1906 tested 5,300 cattle out

of a total of about two million. This represents a little more than two tenths of one per cent, and it cost the state from twenty-five thousand to thirty thousand dollars. I have given you these figures to show you what a problem it is to fight tuberculosis, and those who have studied the proposition most closely are in a position of chaos and confusion. They do not know what to recommend or what to say.

Now taking the figures I have given you, you would naturally infer that perhaps compensation is not wise because everything operates against it. For instance, in the case of Minnesota paying out about \$70,000 a year, we find it would take over 100 years to clean up Minnesota, and that does not take into consideration, mind you, an increase of possibly one per cent. Reynolds, who gives those figures, gives an increase that is greater. According to that we would never be cleaned up.

Now this is the situation. It is a stupendous thing. When a person starts out to study this subject, I think most of you would begin on the assumption that it is not right for a man, in the interest of the state, to suffer loss in his herd. Most people begin feeling that way, but when you go into it and see what there is to it, it makes you question the policy of any compensation or any scheme of that kind, because we have no idea where we are going to land.

That is the situation as it exists. I think the only possible things that can be recommended at the present time and these I would offer tentatively, because I have changed my mind as I have gone on in these studies from time to time and new light has come to me, so I offer these tentatively and with the privilege of changing my mind on the few things I will suggest. First, that it would be wise to pasteurize milk in creameries and cheese factories, and that can be done without serious detriment to the product, I do not know but with improvement to the product; then again if we undertake to do anything that does not undertake to clean up the state in any way, I believe it would be wise to test all reported breeding animals. We have received a great many animals which have been sent over here and they have been rotten with tuberculosis. I have heard of quite a number of that kind, quite a number of animals, and it ought to be checked, so that perhaps the breeding animals should be tested. Here is a point that is recommended very highly by some who are strenuous in their efforts to eradicate tuberculosis, and that is that a certificate of health must accompany every breeding animal that is carried by railway or steamboat line. You can see just what that means. It would mean considerable. As I said in regard to compensation I am not going to recommend or condemn it. I think that is a question that should remain open until we know just what we can do, but there is one thing that I am convinced of and about, and my opinion has not changed in this respect, that no policy should be adopted unless it can be carried through to the end, and no policy should be inaugurated that is to benefit a few at the expense of the many, unless great gains are to be made in the eradication of the disease. I feel that is something we can tie to, because if we start to do anything in Michigan in the way of cleaning up this disease we must not take a backstep because it simply means that we would go right back to where we begun and we will have lost what we put into it. So whatever we undertake, we should undertake with the idea of carrying it out

through to the end and accomplish a little at least by adopting some moderate scheme.

Now after having set before you these figures and the situation, I want to say that a great many municipalities are passing ordinances which require individuals furnishing milk to such municipalities to test their animals. Of course the municipalities only do that to present the spreading of tuberculosis among the inhabitants and of course the dairymen feel that they are ruled against and that they get no recompense for this ruling. I do not believe that any municipality should undertake to pass an ordinance of this kind unless that municipality is agreed upon an advance in the price of milk. That is only fair play. It costs something to test animals and if there is some loss to be sustained that recompense should come back from the increased price of milk, and you can readily see that if milk is increased in price one cent per quart there is considerable recompense for the mere testing of herds, and if there is any loss there is some recompense for that. So that a municipality that is entering upon this policy, it seems to me ought to bear in mind the fact that the producers of milk are entitled to a little higher price, and those I think that are trying to push this matter would be willing, but the question is whether the people are willing to pay that advanced price.

#### DISCUSSION.

Member: How can a dairyman tell whether his herd has tuberculosis?

Dr. Marshall: The only way is with the tuberculin test.

Mr. Deake: Is every man capable of making that test? I have heard said that we should all test our herds.

Mr. Marshall: I think you could if you could see animals tested once. It is necessary to have a little experience. The Wisconsin College of Agriculture is giving a course in tuberculin testing and those lay men all get it and test their own herds and their neighbor's herds but the tests are all sent back to the station for interpretation. Care must be exercised in handling the tuberculin test. Of course the veterinarians object to this and they object to it in some ways rightly, but they are beginning to realize that if they put all the veterinarians of any one state at this work practically nothing could be accomplished. It is almost impossible for the veterinarians to do all the work. If you have any other questions I will be glad to answer them.

Mr. Deake: You recommend that test once every six months? Has it not been known to be a fact that animals tested oftener than that would react on the second test and not the first?

Dr. Marshall: That is likely to be but if your herd is free to start with, there is no object in testing so often for tuberculosis. Perhaps you can get along by testing every two or three years unless you introduce new blood; but if you test now and test in two or three weeks the animals are not liable to respond to tuberculin. You would have to give a much stronger dose to get reaction. It is true that an animal will now and then slip by the tuberculin test.

The Chairman: Are there any other questions? Perhaps we had

better have another song to liven us up before we continue this discussion.

Song by young ladies chorus.

The Chairman: Now we would like to continue this discussion on tuberculosis. Has anyone a question to ask Dr. Marshall?

Member: Do you think, doctor, if the state would pass a law making it optional, but providing for compensation, that it would do any good would it be liable to become burdensome?

Dr. Marshall: I would answer that in this way, although it is a question that I am not anxious to answer, that if compensation is granted and it is an option, there will be certain stock breeders who will improve the opportunity, and in that way some of our best breeding herds in the state will undertake to clean up. I think that some good would be derived from this because if those individuals would undertake to clean up they would improve their own herds and would try to keep them clean thereafter, so something would be gained. As to the burden upon the taxpayer, I will put it in this way, that in nearly every case where they have any system of compensation, there has been sooner or later a very decided reaction and, as I understand it, in the state of Vermont this year they are up in arms because they have practically depleted the treasury. You know that cattle are cheap and quite a number tuberculosis. In New York as well as in Massachusetts they have stopped that, and in some western states they object to compensation. If we could adopt some safe and moderate method and follow it up persistently, I think something could be accomplished but I do not know just how that would work.

The Chairman: Are there any other questions? If not that concludes the program.

I wish to say in closing that we are very glad indeed that we came here to Salem. I, for one, think we have had a splendid meeting and I am sure that I have received a great deal of benefit. We always get benefit from these meetings and I know of no place where we have been that we have met with heartier response than we have here in Salem. I shall be glad, as far as I am connected with the state association to have an invitation to come back here sometime in the future. If we have not succeeded in doing you very much good, I am sure that we have received a great deal of benefit ourselves.

There being nothing further on the program, I think it will be proper to say that we will stand adjourned.



---

---

PROCEEDINGS OF THE  
FOURTEENTH AUXILIARY MEETING  
OF THE  
MICHIGAN DAIRYMEN'S ASSOCIATION  
HELD AT  
CRANSTON, OCEANA COUNTY, MICHIGAN,  
MARCH 22-23, 1909.  
—  
IN CONNECTION WITH THE OCEANA COUNTY  
DAIRYMEN'S ASSOCIATION.

---

---





The fourteenth auxiliary meeting of the Michigan Dairymen's Association was held at Cranston, near New Era, Oceana county, Monday and Tuesday, March 22 and 23rd, the opening session being called to order at 1:30 p. m., Monday, March 22d, with President Colon C. Lillie in the chair.

The meeting was opened with a solo by Miss Hedges.

The Chairman: It has always been our practice to open the sessions of the State Dairymen's Association with prayer, and I will ask Mr. Taylor to offer the prayer this afternoon.

#### PRAYER.

Let us pray. Almighty God, our Creator and Preserver, we come into Thy presence this afternoon with hearts of gratitude, gratitude for the blessings that the years that have past have brought us, gratitude for the prospects which are bright for the future. We have much, our Father, to be thankful for. We thank Thee for health, for life, we thank Thee that we live in this the best time that has ever been, the time that is dominant with good, the time that has possibilities that were never known before, and we ask Thee, our Father, that as we have met together for a short time to consider things in which we as a people are interested, that Thy blessing may rest upon us. May the thoughts that we may acquire at this meeting help us to be better fitted for our duties in life so we may discharge them better, so that we shall give to those that come after us a heritage better than the one we received, that the talents that have been ours to possess may not lie dormant but that they may be increased to bring forth many fold.

Guide us through our walks of life, bless those that shall speak to us this afternoon and tomorrow, may the message they bring be good to thy people. Guide us through life and when life's work is done guide us to Thee, in Jesus name, Amen.

The Chairman: It has always been our practice to give what might seem to some a sort of formal address of welcome and response. It is merely a sort of exercise to break the ice to get acquainted and I believe it is a good feature of the association. I will therefore call on Mr. E. K. Smith, who is president of the Oceana County Dairymen's Association for this welcome. I think it very proper for your county association to welcome the state association at this meeting. Mr. Smith.

## ADDRESS OF WELCOME

MR. E. K. SMITH, HART.

Mr. Chairman, Ladies and Gentlemen:

I never like to offer an apology but I feel at the present time I am obliged to apologize for making this address of welcome before this meeting. It perhaps would be more appropriate for me to open my address and complete it as was done by an old German school director in Pennsylvania, who was in the habit of frequently calling on the school during sessions, and during one of his visits he was asked to say a few words to the students, and he started out by saying "I am glad I was here; I think I was here once before, yes I think I was here two times before. I am glad to see you can write so good on the board. Grow up and be men and some day you will be president of the school board as I am today." I believe that would be a very appropriate address for me to make at this time.

I have been in such a position that I have not been able to collect my thoughts to prepare an address that I would like to have given at this meeting, being under the doctor's care for two weeks, and absent from home for another week, and then being loaded down with work to my utmost capacity I have prepared nothing, but it is a great pleasure for me to know that we have the privilege of having the members of the State Dairy force here with us in Oceana county, to talk to us about and consider the different phases of dairying as they are known in this country and this state at large.

There are many things for us as farmers, particularly for us as dairy-men, to take into consideration, there are many things for us to learn, there are many things that we need to impress upon our minds to realize the most there is to be gained out of these farms of ours. Some years ago, when I first came to this country, the idea was impressed upon me that it was out of the question to think of dairying in Oceana county, that it was not a dairy county, but I will venture the opinion that Oceana county can be made a dairy county if you will only take hold of the business in the right way; if you will only follow the advice given from the experience of others and put their suggestions into practice in a short time we will have a dairy county here that we may be proud of. Furthermore, we do not need to follow dairying exclusively, but we can branch out into other lines of agriculture and work them all hand in hand. We do not need to be like the little boy that was in a class of nature study. He was a pretty wise boy. The teacher was instructing the class along a certain line and she said "Can you tell me what makes its home in the ground?" One boy said "A worm." She said "Yes it is a worm that makes its home in the ground." She talked about the worm for a few minutes and then she said "Can you tell me of anything else that makes its home in the ground." This same little boy said "Yes, I can," but the teacher said "Johnnie, you let the other boys tell," but none of the other boys could tell so she came back to Johnnie and said "What is it?" "I know, teacher, it is another worm." The boy

was wise, he knew it. In Oceana county we have many branches we can spread out in, there are many things we can direct our attention to during certain seasons of the year and prepare ourselves to have an income not only for two or three months, as it would be if we grew fruit exclusively, or farmed general farming crops exclusively, but we can grow crops during the summer months, grow fruit during the season and have the old cow in the winter time, and what we can and must do is to give that old cow the right care and attention. She is a great friend of ours. We can grow crops on our farms from which we will realize a lot of money, and we will have roughage from the crops for feed for our dairy stock.

One of the good things we have in Oceana county is the canning factory products. The pea vine is a great thing for our dairy farms. The pea vine hay after it is cured and it contains as much protein and more than any other dry feed on our farms. If we do not want to use it as hay if we put in into the silos we will have an ideal silage. If we have one silo with pea vines and one with corn ensilage, we will have almost an ideal balanced ration. We also have the sweet corn crop to take into consideration. The corn is harvested and we realize dollars and cents for growing that crop, and the fodder makes an ideal feed. Therefore in Oceana county we have many advantages not possessed by other counties in this state or by other states, my native state Pennsylvania not being blessed with such advantages, where we grew an acre of corn and chopped it up for cow feed not having the opportunity to realize dollars and cents from the crop also and still have the fodder.

There is no reason why Oceana cannot be made a good dairy county as well as a good fruit county as it is today, but in order to do this we must cooperate and work hand in hand. We cannot work individually in this county, in this state or in this world, but we must work collectively if we wish to realize the largest number of dollars and cents.

I again heartily welcome these men here who have an important message to deliver to all of us. I thank you for your attention.

The Chairman: I have not heard from Secretary Wilson but for some reason he is not present so I am going to ask Mr. Hull to respond to this address of welcome. I do not think Mr. Hull needs an introduction to this audience.

## RESPONSE TO ADDRESS OF WELCOME.

MR. N. P. HULL, DIMONDALE.

Mr. Chairman, Ladies and Gentlemen: I am in a little worse shape than Brother Smith, he has been under the doctor's care and got better, while I have not had any help at all yet. However, we have come up in this section of the country and we want to thank Mr. Smith for his very kindly welcome to us. We saw, as soon as we came into the neighborhood, that we were welcome, we realized it still further at dinner time,

and we have gone on realizing it as we have been looking into your faces here.

I suppose Oceana county, in fact I think I have been in this county enough so I can say positively that it is similar in many respects to other counties in the state. We find located on one farm in one section of this county a man working hard summer after summer, the good wife working harder than any woman ought to work, the boys and girls working hard, and although the world has rolled around, ten years have gone by, that man has nothing to show for his work, nothing but the bare fact of having existed. Another man, his neighbor perhaps, may not have worked as hard but at the end of each year he has something to show for his work, and if we stop to inquire we find it is largely because of the difference in methods. The one man pursues the right methods and at the end of the year he has something to show for the year of his life he has put into his labor; the other man follows wrong methods and he has nothing to show for his labor. I believe that every man on a farm ought to be intensely interested in two things and he ought to keep two things ever before him, no matter whether he lives in Oceana county or any other county in the state of Michigan. First, we want to sell as many dollars worth of stuff off our farms as is possible and we want to carry with it as large a per cent of profit as possible; second thing, we want to strive to maintain the fertility of our farms so we can go on, if possible, selling off more dollars' worth of stuff that shall carry with it a larger percent of profit. We who have come up here from other sections of the state to confer with you at this meeting, thoroughly believe that to maintain successfully on the farm the fertility of the soil we must adopt some line of live stock husbandry, and feed out at least the roughage on the farm, and we believe that no line of livestock that a man can adopt will do so much for the average farmer to help him to sell the product of his year's work and get the largest amount of money, that shall have with it the largest percent of profit, and at the same time will keep on that farm and enable the farmer to return to his fields so large a percent of the manurial value of the crops he is taking off his fields, no line will do this quite equal to the dairy cow.

We came up here to talk about this matter. They tell us now that the average cow in Michigan only produces 144 lbs. of butter and there is not much profit in that, and that is true. There would not be much profit in that. That is just the difficulty with the dairy business as well as every other business all over this state and our adjoining states. We are putting in three, four, five and some of us ten years to accomplish what we could accomplish in one year did we understand the principles that go to make successful dairying and did we put those principles into practice.

I happened to be down at Lyons, Ohio, attending a farmers' institute a couple of weeks ago, and a man there gave me these figures. I presume I did look as though I was hearing a fishy story, at least they acted as though they thought I did not believe it, so they made arrangements and got a rig so I could look over this man's farm and his cows. I saw him milk his cows. He weighs his milk twice a day, he had the figures right there for every milking, and his record shows that his best cow gave 14,508 pounds of milk last year, which sold for \$190.82,

just the milk product from one cow. That was his best cow. It is not so strange that a man should have as good a cow as that but the remarkable thing is that the poorest cow gave 10,322 pounds of milk, which sold for \$132.65; his average cow gave 12,253 pounds of milk, and the average cow brought him \$160.14. You say that you cannot do this. Well I presume you cannot this year or next year. In fact Mr. Lillie, this man Standish and myself would feel discouraged if you could obtain such results in one year or two years and beat us fellows that have been putting thought and study into the proposition for sixteen years; but you will never reach that goal or anywhere else unless you practice right methods in dairying. Why, friends, after having been at it for years, not only with my own experience but running up and down Michigan and all those adjoining states as we have, I am sure I can see, and I believe Mr. Lillie will agree with me, that we never have found a man that was getting anywhere near that figure but was following three clearly defined lines, because there are three that must be followed in a certain way, and if these lines are followed you will make a success of this business, and that is what we are up here at this meeting for, to talk about these lines in dairying that enable you to obtain these figures, or at least get the best that we can from the dairy cow, and it is something that we ought to be interested in for we are putting in a certain part of our lives into this work. I am sure that we are going to have a good meeting here and I hope we may all go away a little better equipped for our year's work.

I thank Mr. Smith again for his kindly welcome by words and you all for your kindly welcome in your faces and by your greeting. I want to thank you and assure you that we who come up here very much appreciate it.

The Chairman: I notice on the program that the first this evening is the question box. We have taken this idea from the Farmers Institutes, of giving everyone an opportunity to ask questions, so I hope you will all take advantage of this opportunity to ask any questions regarding dairying or dairy farming that you may desire.

I want to say to you that Dr. Robinson cannot be here until the evening train which arrives at 8:25, and we will get him over here very soon after that. I am sure that Dr. Robinson will have something to say to you that will be of much interest and I hope as many as can will make it a point to attend the meeting this evening.

The first regular topic on the program this afternoon is the care of the hand separator, but as Mr. Fuller is not present we will postpone that until a later time.

Mr. Myers: I suggest that Mr. Taylor be allowed to speak this afternoon.

The Chairman: We shall be very glad to have Mr. Taylor give his talk at this time.

## THE COOPERATIVE COW TESTING ASSOCIATION.

MR. R. H. TAYLOR, SHELBY.

Mr. Chairman, Ladies and Gentlemen:

This matter of a cooperative cow testing association is one that I have thought of quite a little, and yet there has no definite plan come to me whereby it might be made practical to us. I believe the theory is right. In the first place, I believe we keep cows, as has already been stated, for the income we can get from them in various ways. It is also a fact, shown by the records of the cow testing associations that have been published, that a great many farmers keep cows that are not even paying for their board, they are simply grafters on their owners.

While we are willing to go to the work of testing our cows individually, yet it makes quite a good deal of extra work for each farmer to save his samples, deliver them to the creamery to be tested, and he is very industrious if he attends to this matter in the way he should to get an established record of what his cows are doing.

As I understand it, in the cooperative testing association the man who does this testing also informs himself as to the cost of feed that each individual farm or member of the association is feeding, the cost of same, also the amount of butter fat each cow is producing. At the end of a year he will tell you, within a very small fraction, just exactly what income each cow has brought in and the cost of feeding that cow has amounted to, and each man can soon determine which cows are profitable ones or whether he is keeping his cows at a loss.

This topic it seems to me should naturally go hand in hand with the topic of improvement of the dairy herd. I believe there is no way the dairyman can be absolutely certain that sometimes he is not selling the wrong cow except by establishing the record of every cow by the scales and the Babcock test. We very often read of men that sell cows which they think are the poorest cows they have when, as a matter of fact, those cows may be the very ones that are making the greatest profit of any cows in the herd.

There is no organization for the purpose of testing cows in our county, and of course before it can be made practical enough farmers have to cooperate in this matter to hire some man competent to do this work. Just a short time ago I was curious to find out what my individual cows were testing, so I saved samples and took them over to the creamery and had Mr. Myers test them. The results were quite a little different from what I had figured on. The cow that tested the highest was the cow that I never expected would test high and the cow I ranked as a common cow was better than a common cow, as was proved by the amount of milk she was giving.

We are not keeping cows for the fun in it, we are keeping them as a business proposition and it seems to me there is no way by which we can arouse interest in a dairy more than to have some plan of cooperative cow testing, so we may profit by learning which are our best cows

and dispose of those that are not paying, and we can save the calves from the good cows, knowing which to save and which to cast out.

There is another thing. I saw by the report of the last Dairyman's Meeting at Grand Rapids that they have made it possible so that a cow can be registered on performance, and this being a fact there is no other way we can determine the actual value of a cow except through an association of this kind, where systematic tests are made and records of a cow's production kept. I have not formulated any plan but simply bring this matter up, which I hope will be discussed.

Thank you.

The Chairman: This subject is open for general discussion, but since Mr. Myers was the person who called for Mr. Taylor this afternoon I think it is no more than right to call on him to open this discussion.

#### DISCUSSION.

Mr. Myers: I am not prepared to add to this subject but I have given it some thought recently. I was over at Fremont and looked over the working of the cow testing association a little and there is no doubt but this is a great aid to dairying. The first thing that struck me was that all the people over there was very much interested. It occurred to me that such an association might be a good thing to promote interest in a community in dairying in a good many ways, by not only improving the cows but by improving the milk through better methods and more cleanliness, and all this might overcome some difficulties with which we have to contend here sometimes in making butter. I have received bulletins regarding these associations from Mr. Lillie, and the only thought that seemed to stand in the way was that our herds were too small. He has argued that our expense should not exceed \$1.50 a cow. Our herds consist of from three to ten cows and we could not run an association at that expense, we could not hold the expense at that limit. That is the only difficulty that stands in the way but perhaps that can be solved.

The Chairman: Has anyone else anything to say on this subject? We would like to have it discussed.

Mr. Taylor: I would like to hear from Mr. Lillie on the subject.

Member: How many cows are necessary to start an association of that kind? That is one reason and I might say the only reason I came up here, is to see if in some way we could not start such an association. I live in Muskegon county. They speak about not having many cows around here. I thought by extending the district of the cow testing association it might go down even to Whitehall and so on North, taking in the two counties, and have plenty of cows so we could hire our men to start this association.

Mr. Lillie: A man can only test twenty-six herds of cows in a month because there are only twenty-six working days, unless two farmers live right close together, across the road or a short distance apart from each other, so he could test two herds in one day. A man can test thirty or forty cows without any trouble. The work is not difficult so he can do the work all right. The trouble is to go from one farmer's barn to the other. That is the only handicap to the cow testing association,

and of course a man wants as good wages as he can get. Some people wonder that we can get anybody to do this testing at \$1.00 a cow where a man has only 300 cows in an association. A man has to put in his year's time for \$300 and that is not very large wages but he also gets his board, and it is not hard work. A cow tester can be a person that is hardly able to do severe physical labor, but he must know how to figure up, and it is not necessary that he be a strong man physically. You can sometimes find men who are willing to do this work for years because they are not able to do severe physical labor and they can do cow testing.

The idea in putting the price down as low as that is to get the farmer to come in and have his cows tested. The price here is put down at \$1.50 a cow and I do not know of any association that is paying over \$1.00 a cow, and where dairying is intensive enough there is no trouble about that. A man could test 500 cows if he had them in the right shape, that is if he had 500 cows in twenty-six herds. There is no trouble at all to test them, and if a man receives \$500 a year and his board and lodging, it is a pretty fair salary.

Mr. Rabild, who started this work in Michigan, is now with the Dairy Division of the Department of Agriculture and at the present time is organizing cow testing associations in Wisconsin, and they do not have very much trouble up there in organizing associations and getting men to operate them. They are more interested in dairying over there and have little trouble in starting anything of this kind.

To refer to this idea that you have some of the herds in Oceana county and some in Muskegon county, that would be entirely practical. In our neighborhood at Coopersville we have cows in different sections. A man can work backwards and forwards along the neighborhood but he is out his fare on the railroad. The other way we simply haul the man from one station to another. In this day and age the farmer would as soon pay his fare to Grand Rapids, thirty-five cents as to hitch up and go thirty-five miles.

The tester comes to my farm this afternoon, sees the cows milked, weighs the milk, takes a sample of each cow's milk; he sees the cows fed, weighs the feed, and charges the feed to the cow at the market price. I do not know but Mr. Taylor might have given you the idea that the cow tester fixes the price, but that is not so. The association fixes the price of clover hay, corn silage, corn stalks. Then he has a Babcock tester with him and tests the milk of each cow, then figures the number of pounds of butterfat each cow is producing and gives her credit for it, having previously charged her with the cost of her feed. There is some figuring there but it does not take long to do it; in a moderate herd it would only take a few minutes time. When he gets through, the farmer hitches up and takes him to the next member of the association, where he goes through the same operation. In Coopersville the first year the young fellow that did the testing got lonesome because he did not have enough to do; he worked for the fun of it, sometimes helped the farmers milk. You can see it is not hard work to do this testing but you want a careful, competent man and of course you have to pay fair wages in order to get a good trusty, competent man to do the work. Last year we guaranteed our man \$300 a year. One or two men dropped out because they have made a change in their business, one man sold most of



his cows, so we had less than 300 cows in the association and we had to make an assessment to get money to square up for last years' business, but this year the man has more cows than he can test and he is testing in the neighborhood of five hundred cows. Of course that makes fair wages. Our cow tester is a young Dane. He came here two years ago and could scarcely speak a word of English, but he had been accustomed to this kind of work in the old country and could do the work accurately, knew what to do; if he had not known we could not have got along with him at all because we could not make him understand. He could read English and write but could not talk very well then although now he talks very well indeed. A man like that of course is willing to work for less wages now than he could next year or the year after when he understands English.

There is another way you can make a cow testing association practical, by having a man work at testing cows a portion of the time and the rest of the time do something else. For instance, suppose there were four or five or six or a dozen farmers in this community that wanted their cows tested. Perhaps you could get some man in the vicinity that would do this work for \$1.00 a cow. It would only take six days a month if he had six herds, he could do that work and the balance of the time attend to his own business. Where twenty-six men want to come into an association, as was intimated by Mr. Myers in this vicinity, and they only own from six to ten cows, the only way I can see is to pay more than a dollar a cow.

Mr. Hull: Would it not be worth \$2.00 a cow?

Mr. Lillie: It is worth \$5.00 a cow. When you find in your herd one cow that is bringing you \$3 worth of milk at market prices for a dollar spent in feed, and standing beside her in the same stable you have another cows that is eating as much feed and only brings fifty cents worth of milk for a dollar's worth of feed, how much is it worth to find that out? A dollar is nothing. I had to go out last summer and buy thirteen cows to fill up my dairy barn. A man came along and asked me to put a price on some cows and heifers and I unfortunately did not put a big enough price on them so he bought them, so I went out and bought cows. My brother-in-law, who had these cows in the test association, had four cows he wanted to sell. Of course he had four heifers that he thought were going to be superior dairy cows and he had to sell some cows to make room, so he picked out the poorest cows, but they were cows that produced something like 300 pounds of butter-fat apiece according to the cow testing association. I asked him how much he wanted for the cows and he said \$50 apiece, so I gave him a check for \$200 for the four cows, and I picked up the rest at from \$35 to \$45 apiece. One cow a very ordinary looking animal I bought for \$30; she freshened in December and went into the testing association then, and do you know that cow gave me \$2 profit for every dollar's worth of feed I gave her? Some of the other cows I had bought were hardly paying for their board. How much is it worth to know what kind of cows you have? I remember when we were trying to organize our cow testing association at Coopersville and had our dairy meeting there, I got Mr. Rozema of Fremont to come down there and talk on this subject of cow testing associations. During the course of his talk

he told them about his experience. He said he thought he would sell a couple of cows because he did not like their looks, they were raw boned and did not give a very big mess of milk so he thought he would get rid of them, but after the cow testing association was organized he found those were the most profitable cows in his herd. They did not give extremely large messes of milk but they kept persistently at it, and that is what counts. It is on the same principle as the race between the tortoise and the hare. The hare was swift but he went to sleep so the tortoise went by him. That is the way with those cows that give a large mess of milk and go dry in a few months, they cannot compete with their more modest sisters that keep at it every day in the year, and we want to test a cow for a year because we have to feed her for a year and we want to know how much profit she makes in a year.

I do not want to say how much it would pay farmers to pay a man for testing their cows if it was necessary, but I am positive it would pay me a good many times what it is costing, \$1.00 a cow, to do that testing. Rather than let our cow testing association go down, we would be willing to pay \$3.00 next year to keep it and we have been in it two years now. My cows are cared for entirely by hired help and the cow testing association is a check on that help as well as a check on the cows, so it is profitable both ways. My cows are pure bred and when I get association records of my cows I can sell their calves better. If I can show the figures of a disinterested man people have to believe the records, so that I can get good prices for my calves, and the association pays me in that way. The ordinary farmer cannot afford to be without a cow testing association if he can get one without any extraordinary amount of expense.

Are there any other questions? I do not believe there is a phase of dairying as important as this cooperative cow testing. I consider it the very foundation of successful dairy farming. We know what it has done in Denmark, Holland, Norway and Sweden, and those countries where the cow testing associations have been going on for a number of years. You can see what it can do in this country; it is the basis for dairy improvement, it not only puts dairying on a cash basis but it gives the foundation for the upbuilding of your herd. Supposing you have one cow in your herd that is giving you \$3 worth of milk for a dollar's worth of feed and another cow giving you fifty cents for a dollar's worth of feed, would it be good judgment to raise the heifer calves from that cow giving you fifty cents for a dollar's worth of feed and keep that kind of animal perpetuated in your herd? Yet without the association you would not know the good ones from the poor ones. You may think you do, but no man can tell.

Member: Don't you think such an association is an inspiration to the farmers to help build up their herds?

The Chairman: Over at Fremont is one of the most interested dairy communities in the state today. When they organized their cow testing association over there, there was not a registered sire in the community. The association over there woke the people up and they saw that blood would tell in dairy animals. I do not know of anything that will drive this dual purpose idea out of the minds of farmers any quicker

than a cow testing association. You will find you can breed cows to give milk as well as you can breed horses to trot. There is no more sense having a beef cow in a dairy trying to make a profit out of that cow's milk than there is to put a Percheron on the track to compete with the American trotting horse. The dairy cow has been accustomed for generations to consume large quantities of feed and put that feed into the milk pail, and she can produce milk more economically than cows bred to put the feed on their backs in choice cuts of meat. Your eyes are opened by such an association. You know as well as I do that you go along with the dairy herds and you give each cow any particular attention. You feed them all alike and you do not pay much attention to any one individual, but when you keep a set of books and charge each cow with just exactly what it costs to feed her, giving her credit for what she brings you in, you are interested at once in every cow in your herd. It does make the dairy farmer more interested. How can it help doing so? He is a better dairyman. If he does not produce butterfat as cheaply as his neighbor he is interested to find out where he is making a mistake.

Those of you who were at the convention of the State Dairymen's Association at Grand Rapids and heard Mr. Hawley speak on this subject heard him say he saved enough the first year on the ration the cow tester figured out for him, to pay the cost of testing his cows for ten years. He had what you might call dairy bred herd and it cost him eight or ten dollars a month to feed those cows. He was not getting milk enough to pay for the ration. Mr. Rabild went with the cow tester to Mr. Hawley's farm, in order to get him started, and soon as they commenced to weigh the milk of each cow, Mr. Rabild said "You are not getting enough milk to make you any money, you will have to change your ration to make a profit." He was feeding high priced corn meal, ground oats and timothy hay. The cows were fat and sleek but he changed his ration and Mr. Hawley began to make some money then.

We have in the state of Michigan four cooperative cow testing associations. Denmark is a little kingdom, about one quarter the size of the state of Michigan, and yet that little kingdom has over 400 cooperative cow testing associations. If we had cow testing associations in proportion with Denmark, it would give us over 1,200 in Michigan instead of four, so we want to discuss cow testing associations at all dairy meetings so everybody will know about them. The cow testing associations in Denmark have increased the profits to the farmers 75 per cent, and in numerous individual instances the profit has amounted to over 100 per cent. Anything of that nature that will do that for an industry is certainly something that is worth our earnest and careful consideration. Are there any other questions?

Mr. Meyers: I think it is a good paying thing, because my son, who works in the creamery, has been testing my cows. I have a good cow, three-quarters Jersey and one-quarter Durham. That cow never gave much milk, so I asked the boy to test her and found she tested 5.4. I got that cow through accident.

The Chairman: Mr. Myers says by accident he got a good cow. Mr. Cannon says in the chapter of accidents he became speaker of the House of Representatives. That is the way with thousands of dairymen in the

state of Michigan today. They have some good cows and do not know how they ever came to get them, and they have too many poor cows that they do not know how they got.

Member: How many times a year should a cow be tested in order to get an average test?

The Chairman: The oftener the better. There is no question about that, but it is not practical in this cooperative cow testing association to do the testing oftener than once a month because we cannot afford it. This is an important question and I am glad that it was brought up. Some people will say "If you only weigh the cow's milk one day in each month you will not know much about what she does give, it is a guess anyway." The Danish government has found by testing a cow one day in each month and then estimating fifteen days back and fifteen days forward, that it will give an average that will not vary more than 4 per cent from the actual yield of the cow for the year. I learned that lesson a number of years ago, when we first began weighing the milk of our cows, right after the world's fair at Chicago. I did not think that we could afford to weigh the milk of each cow twice a day. It is not as big a job as I thought it was then but I did not feel that I could afford to take the time of the hired man night and morning to weigh the milk twice a day. Someone advocated that it would be all right to weigh the milk one day in a week and estimate from that. I did not know much about it but I took records of cows in the world's fair test at Chicago, took a certain day in each week, got the average, multiplied it by seven for a week and so on through the whole test. I compared that with the actual number of pounds and I was surprised to see how closely the two amounts came, so I have advocated weighing the milk once a week and estimate from that, or once in ten days so as to figure more easily. After Mr. Rabild became connected with the Dairy Division of the Department of Agriculture, Chief Webster and Mr. Rawley questioned this same point. They thought the cows ought to be tested oftener in order to have careful records to know what they were doing, so they sent Mr. Rabild to Minnesota to the experiment station to make a careful investigation. Professor Haecker, of that state, has records of the dairy herd at the experiment station for something like ten years; he knows just how much milk every cow has given every night and every morning for ten years. Those are the most complete records we have in this country. Mr. Rabild went over there and investigated this. He took a certain day in each month, went through those records year after year, and made his estimates in that way, and while I cannot now give you the exact figures, I know there was only a variation of a few pounds of butterfat in the ten years, no more than the Danish government claims they varied, not to exceed 4 per cent. If that is so, once a month to test the cows is often enough to determine their relative value. When we commence to study this subject a little we know that when a cow is fresh she gives more milk than at any other time during the period of lactation. Through natural causes she gives less and less until finally she goes dry.

Member: Do you keep testing the same cows year after year?

The Chairman: Yes sir, a cow will not always do her best. One year she may make a big yield and the next year she will not do so well.

We have had that question asked by some of the men in our association, they had their cows tested last year and what is the use of having the same cows tested over again? There are several reasons for that. If you have tested your herd and know your cows are all good profitable producers, you will find some better than others, just as Mr. Hull told us about a herd where the best cow gave 14,000 pounds of milk and the poorest 10,000 pounds, a difference of 4,000 pounds at the end of the second year you may find your cows have still farther improved, and a record of five years will give a still more definite knowledge of which are the best cows. If you are going to discard any individuals you want to keep the cows that will give you the largest profit in five years, so as to raise the heifer calves from them.

Member: Cannot that testing be done by the farmer himself? We have one man in our neighborhood that does that himself.

The Chairman: It can be done by the farmer himself but the average man will not do it. The average man will form resolutions and say "I know it will pay to do this." He will get a scales and tester and say "I will know what my cows are doing," but in the spring he will not have time to do it and then he will neglect it and at the end of the year he will not have a record worth a row of pins. He can do it but he does not. We have advocated that ever since the invention of the Babcock test, that every farmer ought to have a Babcock tester and pair of scales and know what each cow is doing, but how many farmers in Michigan are doing that? I bought a Babcock tester a good many years ago and used it right along but it was a big job to test the cows. Finally I got in the notion of getting milk bottles and taking the sample of each cow and bringing the samples to the creamery to get them tested, and when we got thirty or forty cows it was quite a job to run them out with a six bottle tester so we got the buttermaker to test them and that worked very nicely, but nothing works so nicely as to have somebody else that has nothing to do but do this work. Without an official tester you do not keep as close watch on the ration as you ought and you do not know how much it costs to keep a cow. The theory is all right but I tell you the farmer has never done it and never will. He knows it is right and will say he will do it, but he will not.

Mr. Taylor: If he had a good record do you think he could make his neighbor believe it was correct?

The Chairman: Your individual record does not go very far. Your own father might say he believed that record was manipulated if you have a cow that beats his. The American Jersey Cattle Club allowed private tests; if a man had a cow that produced 14 pounds of butter in seven days it was eligible, but they had to cut those tests out and make official tests, because some unscrupulous fellows would make their tests read just a little higher when he wanted to sell his cattle, and they will not accept a test now unless made before a disinterested man and a man recommended by the experiment station of the state in which the farmer resides.

Member: Will the creamery accept those tests?

The Chairman: No, most of the creameries receive cream, so the test of the cows would not tell anything about the test of the cream, and when you mix the milk together and take it to the creamery you have

a herd test; but it is a pretty good check on the creamery. Don't you see, if you have ten cows and they all test a little different, if you add that test together and divide by the number of cows that would not give the test of that milk after it was all mixed and you got a sample out of that milk, because the cows give different quantities of milk. When it is all mixed together, your composit sample of herd milk would not test as much as the average of all the cows because there is more poor milk in there in proportion than there is rich milk, but it is a good check on the creamery. You have the tester right there and you can have him take a sample of your herd milk before you send it to the creamery and in that way keep a check on the creamery.

### LIGHTING AND VENTILATING THE COW STABLE.

MR. COLON C. LILLIE, COOPERSVILLE.

I will take up the subject on which I was to speak this afternoon, lighting and ventilating the cow stable. This is one of the important questions that the dairymen have to consider today. Perhaps you never thought much about it but the question of lighting and ventilating a cow stable is a good deal more important today than it was twenty years ago. I mean in this county, in the state of Michigan, I mean anywhere, that the subject of lighting and ventilating a cow stable is of more importance today than it was twenty years ago. Why? Because we have changed in our ideas about caring for dairy cows. Twenty years ago the dairy cows were turned out in the morning and left out all day long, it was dark before they were put in. In the day time they were in the open field and got all the sunlight there was. What good does windows do in a barn in the night? If your cows are out doors in the day time what is the use of discussing the question of well lighted stables? But during the past twenty years we have found out by actual experience that it pays to keep the cows in the barn in the day time when the weather is cold, and when we do that then the question of properly lighting these stable is an all important one.

Neither animal life nor plant life can thrive unless it has plenty of sunlight. You cannot keep an animal in a poorly lighted barn day in and day out and have that animal thrifty, healthy and vigorous. She has got to have the sunlight.

Now then, if modern experience in dairying proves to us that we have to keep the cows in the barn where it is warm, in order to get the most profit out of her, then we have to put windows into that barn to let in the sunlight. That is why the question of lighting the stable today is an important one because we have come to the conclusion that if we want to get the greatest profit out of a dairy cow we must keep her warm. One man says "I would not have a modern dairy cow, she is a hothouse plant." Now, my friends, we do not keep the modern dairy cow in the barn because she is not tough, she is as tough as any creature on earth, she will stand as much on an open field as the fat-

tening steer if we give her what she wants to eat, but she will not give you much milk. That is all there is to it. We do not put her in the barn because she cannot stand the cold because she can take care of herself but we keep her in the barn because we have learned from actual experience that we have got to protect the dairy cow against inclement weather if we want her to give a maximum flow of milk in cold weather. That is the reason we keep her in, because it is profitable, it is not because she is tender.

A great many of us have not as much sentiment as we ought to and we figure the dairy cow is nothing more or less than a machine to convert the feed on our farms into milk, so we do not keep her in the barn from sentiment but we keep her there because it is profitable to do so. I believe my cows have not been out doors all winter. It has been a sort of evolution on my farm, about keeping cows in the barn. At first I thought they could not do well if they stood in the barn, that they had to get out every day for a while and get some exercise and then go back on the barn; then we got so we did not turn them out every day, but I thought they must go out at least twice a week and whenever there came a nice warm day, like today, we let them out and I do not think it hurts them any where the temperature is above freezing; but when a farmer has fifty cows and lots of chores to do, he has to make up his mind that it does not do them any good to go out and he does not let them out. Every time you let your cows out they shrink in their milk. Our experience has proved that our cows kept healthy without going out doors, they are vigorous and their offspring are healthy and vigorous, so what is the use of turning them out? It is lots of bother. Each cow has a bucket from which she can drink when she wants to, the stable is warm enough so she does not shiver or anything of that sort. That is all she asks to be comfortable, happy and content so what is the use of turning her out? My cows are tied up with chains around the neck but each one in a stall by herself. The old idea was the dairy cow had to be turned out in order to have physical exercise, to keep in good condition, but we have learned that the giving of milk is exercise for the cow. She is working when she is elaborating milk and that takes the place of physical exercise. Did you ever notice a good mature cow, a good sensible cow, that you thought your most sensible, best cow, in the summer on luxuriant pasture? Did you ever notice she did not run around much to get exercise? You put her on good feed and she will go in and eat all she wants and then she will not run around for exercise but will lie down and chew her cud until she gets hungry again and then she will get up and eat. A cow giving a maximum flow of milk does not need much exercise to keep her in health and she will not take it unless she has to.

When you get in the habit of keeping your cows in the barn you must have the barn well lighted. You have to have sunlight in the barn or you cannot keep them in good condition. If you have a barn with one little window over the front doors, as you will find in some dairy barns in this state, then look out, you will have your cows out of condition, you will have them so they will not look thrifty. A dairy barn ought to be as well lighted as this building. You do not want a dairy barn so dark that you have to light a lantern to find a pitchfork in the day

time. You ought to be able to read a newspaper in any corner of it. Sunlight is the best medicine that any animal ever had or ever will have. We hear so much these days about the terrible microbes that a man feels his life is not safe. They tell us that microbes are floating the air everywhere and we breathe them into our lungs and the first we know we have tuberculosis. If you are healthy and vigorous and sleep about eight hours every night you need not worry so much about tuberculosis, I would not think about it until I had to and we need not worry about getting tuberculosis from drinking milk from a good healthy cow; but we do know that many of those diseases, especially tuberculosis, are contracted from germs that are in the atmosphere. Now those germs do not thrive and multiply in a well lighted room, like this, where we have direct rays of sunshine and plenty of sunlight. There is no kind of germ that will live for any length of time in the direct ray of the sun. That is the reason we want sunlight in the stable and we have to have it. Your potatoes sprout in the cellar in the spring if it gets warm enough but they grow up like spindles in cellars without ventilation.

If you have not plenty of windows in your barn, turn your cows out doors every day and give them plenty of light. If your barn is well lighted, the way this church is lighted, you do not need to worry about your cows getting out of condition by being compelled to stay in the barn.

Now this question of ventilation. That is more important today than it ever was before just because we modern dairymen have come to the conclusion that we can afford to keep our cows only in the barn. We have quit trying to warm up the barnyards by feeding corn; we think we must have succulent feed now, and we cannot feed succulent feed to a cow in a freezing atmosphere and get good returns. If you feed succulent food you must have your cows in a temperate atmosphere. If you feed them out doors in cold weather, do not feed corn silage or roots, give them dry feed. If you feed succulent feeds have them in a warm barn or you will not get best results.

In this question of ventilation, ventilation is simply a winter problem, a cold weather problem. We do not have to discuss ventilation in the summer time, in mild weather, because ventilation is simply a change of air. That is all there is to it. When animals breathe air into the lungs the oxygen in the air goes to purify the blood and the animal expels from the lungs the residue which it does not want, or carbon dioxide gas. The only way to keep air pure is to have some air that has not been breathed so as to mix with this air and put more oxygen into it. I used to think that after a while we would not have any more pure air, that if the animals had breathed all the air in the universe the carbon dioxide would become more abundant, but the Creator has made provision for that and He has made a trade between the animal life on earth and the plant life on earth, what is poison for the animal is food for the plant. The animal breathes out carbon dioxide and the leaves of the plant breathe in carbon dioxide.

If we are shut up in a room without ventilation for a certain length of time, after a while we begin to feel drowsy. We breathe up all the air there is in the room and we are breathing impure air, and it is having its effect; if we lower the windows or open the door, the warm, im-



pure air in here will rush out and the cold pure air rush in and we will get a change of air and we have the room ventilated under normal conditions. That is all there is to ventilation—a change of air, and so I say it is a cold weather problem because in the summer we can throw doors and windows open, but in the winter time we want to keep the temperature of the cow stable at a certain degree, not lower than 40 degrees, and at the same time we want to have our cows breathe pure air.

It is not a problem to ventilate a dwelling house because in the house we have artificial heat and we can always get a circulation of air if we have artificial heat. We can ventilate a living room or this church very nicely by lowering the windows, and if that makes the room too cold all we have to do is to put on another bucket of coal or another stock of wood in the furnace or in the stove. The cold air will come in here and if the room gets too cold all we have to do is to put on more fuel and that will warm it up and keep pure air in. We cannot do that in a cow stable because we have not artificial heat and we have to figure a little differently in ventilating a barn than in ventilating a house.

For the health of the children and the old people too, most people are a little too afraid of fuel in their houses; they figure every way in the world to save fuel. Down in our little town they have an anti-tuberculosis society. My wife belongs to it but I do not, I am not at home enough to make it pay anyway. One night she came home from a meeting, at which a doctor from Grand Rapids had discussed tuberculosis, how to prevent it, and she said to me "If you had the authority so you could, what would you do to eradicate tuberculosis?" I said "I would go into every room in this village with a bootjack or hammer and knock out a pane of glass from the window, and not let them replace it." What we want is pure air to eradicate tuberculosis. I remember when a boy going to the district school that there was one family whose children were chums of mine, and those children were always sickly and eventually every one of them but one died of tuberculosis. I remember of going to that neighbor's to stay all night and I can realize now the conditions, I could not then, but I knew that was the funniest smelling room I ever was in in my life. I really do not believe the windows had been open in that room all winter, and those boys were breathing over and over that same air. Their father was a good carpenter and had a good house and made the windows fit closely so the cold would not get in, so he kept the bad air in and they breathed it over and over and over again. The mother did not understand those things, the room was never ventilated, and I believe that is the reason why those boys got tuberculosis, because they had to sleep in unventilated rooms.

The same principles apply to cattle as to men, just exactly. We have to have pure air for animals to breathe or else they become weakened constitutionally. They are debilitated and when they are debilitated and we have one of those germs floating in the atmosphere, it is breathed into the lungs, goes into the mouth and gets into the alimentary canal, and the animals are inoculated if they have not vitality enough to throw it off; while the animal that has been breathing nothing but fresh air can throw off those germs without contracting tuberculosis.

You can ventilate a cow stable as you would a house, by opening the windows, but do it at the expense of the warmth of the stable. You can do it by hay shutes that come down. The warm air rises and goes up that hay shute and the pure air comes in through the cracks and breaks and takes the place of that and you have a change of air and ventilation, but you have done it at the expense of the temperature of your stable. A cold night you cannot keep the stable at 40 degrees, it will go down so it freezes and you do not want to do that because your cows are not comfortable there. You have to solve this problem. The animal breathes out carbon dioxide gas; that gas is heavier than the air and tends to settle to the floor of the stable. We know that carbon dioxide is the same gas we find in deep wells or cisterns and we know people have been overcome by carbon dioxide by going into a cistern. It was only two or three years ago in this state that two or three people were killed by going down to clean out a cistern because carbon dioxide settled in it. You can tell whether there is carbon dioxide in a cistern or not because if you lowered a lighted lantern, if there is any of the carbon dioxide down there the lantern will not burn. If you lower a lamp into a cistern and it goes out do not go down until you bale out that carbon dioxide. You can bale it out the same as water. You throw down the bucket and dip up a bucket full of carbon dioxide and pour it out. You cannot smell it or see it but you know it is there and after you have baled long enough you can lower your lantern and it will burn.

In the stable the cold air is pure warm air, and that tends to settle to the floor if your stable is tight. The warm air rises up to the ceiling because when you warm air it becomes lighter than before it was heated. You then have the warmest purest air next the ceiling and the coldest, most impure air nearest the floor. The problem is to get this impure air out of the stable and not let the warm air out also. If you open the windows the warm air will rush out and the cold air come in. After a while you have a change of atmosphere there and it will be all right to breathe again but it is a slow process and those currents of air cool your stable, and you do not want that. The problem is how to get this cold, impure air from the floor and save the pure warm air near the ceiling.

Professor King solved that problem. He says that if you make an opening through the walls of the stable up next the ceiling, you will have two currents, warm air to go out and cold air in, but if you box that up the cold air will go into the bottom of the box and get into the stable and the warm pure air cannot go out. We call them pure air intakes and they ought to be all around the barn. You want them not over two by eight inches and you want enough around the barn so if the wind blows freely from one direction you can close them on that side and still have enough on the other side to supply your cows with air. He solved the problem of letting the impure air out by going over to one side of the stable and building a chimney. We call it a ventilating shaft. That shaft is open down near the floor, is boarded tight all the rest of the way up through the stable and out the roof. You must be sure to have the chimney tight or it will not draw. Now then the pure cold air intakes and mixes with that warm air up there and that forms a circulation, the cold, impure air on the floor moves to your

ventilating shaft and up that shaft out doors. In that way you have circulation of air and do not lower the temperature.

It is not very expensive to put in the King system of ventilation. You do not have to have an expert to do it. Any farmer who can saw a board and drive a nail ought to put in that system. You can nail two by fours on either side of the hole and have matched lumber for those two by fours. Have them come as far as the wall. That forms your intake. The ventilating shaft is a square box; have two by fours for the corners put on matched lumber, then building paper and another tier of matched lumber so as to make it air tight, and you have your system. Mr. Gurler, of DeKalb, Ill.' in his large barn, instead of putting in one ventilating shaft built four small ones in two corners. You could make the shaft practically air tight, if you wanted to, and put it in the corner a foot from the floor and have it extend up through the stable and out the top, but where you have more than one ventilating shaft in a stable you are liable to get counter drafts. You know what is meant by that, you know if you have two fire places or chimneys in the same room, if you have conditions just right, instead of both fire places drawing, cold air will come down one fire place into the room. You will find that one ventilating shaft is better than more, but you can have two of them if you desire.

We cannot keep the modern dairy cow the way we know she ought to be kept for the greatest profit without keeping her in a well lighted, well ventilated stable. We must have these two regulations in a stable, it must be well lighted and well ventilated. If you do that you can keep the dairy cow in the barn all the year round if you so desire. If you keep her in such a stable, feed her properly, care for her properly you need not worry about her health or her vigor.

I think I have covered the subject and thank you for your attention. The subject is now open for discussion and I will be glad to have anybody discuss it or ask questions about it.

#### DISCUSSION.

Member: Is it necessary to have the cold air inlets outside the barn or inside?

Mr. Lillie: It is better to have them inside the barn because it is better to have the bottom part of the chimney as warm as you can get it. Governor Hoard's new barn is built in the form of an L. He put his ventilating shaft in the L of the two barns and that works nicely. You could build a ventilating shaft outside but it would not be as apt to work well situated on the outside because, don't you see, the air in the bottom is heavy and the inside would be the same temperature as the stable. If the cold air settled down there it would be impossible to get it started.

Member: How large should the ventilating shaft be?

Mr. Lillie: That can be figured up, there is a rule to follow but I cannot tell you at this time what the rule is.

Member: My stable is small, 36 feet long and 14 feet wide.

Mr. Lillie: One shaft would furnish ventilation enough for cows and horses just as well if you take off the bottom board between the corn barn and horse stable, the cold air would flow through. You would

want your shaft one and one-half foot square. A box two and one-half feet square would have a good deal more capacity than one one and one-half foot square. Take tile for instance. If you have a two inch tile and a four inch tile, the amount of water that goes through the two inch tile or four inch tile is out of proportion to the square diameter. Your ventilating shaft would not be so much smaller if your barn is 36 feet long and 14 feet wide. I think not more than a foot smaller.

Member: Does the height of the air shute have something to do with it.

Mr. Lillie: Yes it must go through the storage part of the barn, through the roof and the higher it goes the better it will be. It ought to be above the peak of the barn so the air would not come over the peak of the barn and go down your shaft, as is sometimes the case with a chimney.

Member: Would it not be just as cheap to build a ventilating shaft of galvanized iron, as to have double boarding and matched lumber with building paper between?

Mr. Lillie: I am inclined to think galvanized iron would cost more.

Member: It would take less time to put it up.

Mr. Lillie: If you solder the joints I think it would cost a good deal. How are you going to solder them if you put them in?

Member: If they were tight I think they would not have to be soldered and they may be made tight enough anyway.

Mr. Lillie: Don't you think the top ought to be as well constructed as the bottom?

Member: Coal tar or asphalt could make them tight.

Mr. Lillie: I think you should have the top of the chimney tight. You can figure that out yourself and use whatever you desire, but sheet iron is a pretty decent sort of lightning rod. If you line that with metal you ought to connect that metal with permanent moisture as you would a lightning rod, and then it would make a good lightning rod.

Member: Do you make this shaft the same all the way up?

Mr. Lillie: Yes, the same size.

Member: In building a brick chimney they have the top a little larger to make a better draft.

Mr. Lillie: It would be quite a job to make a big shaft bigger on top.

Mr. Taylor: In constructing this main shaft, the cold air shaft is it practical to run it on a slant? If in the upper part of the barn there is something in the way, would it work all right to have it slant somewhat?

Mr. Lillie: Yes, but it would not be so good because there would be friction there. It need not interfere with anything. Put it to one side of the barn, run it through the side of the barn and up above the peak and you have it right out of the way. Do not put it where it will interfere with anything in your barn.

Member: Did you say to cut the intake opening at the top of your wall?

Mr. Lillie: If you were building a new barn and had a hollow wall you could have your intake proper right in that wall if you wished but you would have the bottom opening on the outside and the top opening on the inside. We cut a hole right through 2x8 inches and then

we box that hole up square, extend that box down on the outside of the building, then the cold air comes in the bottom of that, comes up the box and through the opening, but the warm air in there cannot get out.

Mr. Taylor: This is a very important subject. I have a basement stable and it lacks two things and I promised myself last year that I would have a good foundation and windows. In the morning when I go down the stable is warm, we have plenty of light but when you go in there you feel as though you had fallen in a well, that is after the cows have been in there all night. My stable is 34x52 outside measurements for the barn and I have stable room for about 16 head of cattle and four horses. How large a shaft would I need to take out the impure air and how many 2x8's?

Mr. Lillie: I would have as many as six of those intakes on the side and two or three on the end if I could get them in, and I should say a ventilating shaft two feet square would be amply large.

Mr. Hull: Why would six on the side be better than three?

Mr. Lillie: I would have the same amount of air from the six as from the three and have them smaller. If they are larger you are liable to get drafts. What you want is to have the air come in there and mix with the warm air without creating drafts. I would rather have five or six on either side and would not have them over 2x8. If you make them 8 inches square you would have a hurricane coming in there in a bad wind.

Mr. Hull: If you have 2x8, three on a side and two on the end, you would have plenty of fresh air then, wouldn't you?

Mr. Lillie: I would rather have too much than not enough. We are just guessing at this anyway but if you get Dr. King's book on Agriculture you will find this rule is figured so you can figure it out for yourself just as he has figured it out. I would say five or six of those on a side and a ventilating shaft. I have an idea if it were 18 inches square it would be a big enough chimney to ventilate that barn, but I am very positive two feet would be, and it would be nearly as cheap to build one two feet as 18 inches.

Member: Providing the top of your basement barn was on a level with the ground, from where would you get fresh air if there was not over 18 inches difference between the ceiling of the stable and the ground?

Mr. Lillie: How do you light such a stable?

Member: By windows above the wall.

Mr. Lillie: Can you get a good light?

Member: I do not get enough to suit me.

Mr. Lillie: You know how they light basements in the city, they dig down a square hole six feet square, dig it right out and wall it up, and put a window right down there. That is the only way I know you could get cold air, would be to dig places so as to run your box to get it. If you would take a plow and scraper and scrape the dirt around that barn away so your basement would be above the ground it would be easier to keep your cows.

Member: Yes but the water would run in to it.

Mr. Lillie: You could have a cement gutter and run it off. A man

ought to have the stable floor in a basement barn four inches above the outside ground.

Are there any other questions? If not the time set for adjournment, 4:30, has arrived. I am sure you will be pleased if you turn out for the evening program. If there is nothing further to come before this meeting, we will stand adjourned until 7:30 this evening.

---

### MONDAY EVENING SESSION.

Meeting called to order at 7:30 o'clock by President Lillie.

The Chairman: We will first take up the question box. If you desire to ask any questions about dairying or dairy farming, you may write them on slips of paper and Mr. Hull will collect them, and we will take a few moments to discuss them.

#### QUESTION BOX.

Question No. 1. Will it pay to have a silo for six cows, Mr. Hull?

Mr. Hull: If that is all the stock you have and if you have no young stock, it is along the border line; but I believe I should say it would pay to have a silo for that many cows, especially if you have high priced land or if the land is of a light character, where you are troubled in the summer for pasture; build a silo for the six cows, making it small in diameter and a pretty fair height; feed silage in winter and have enough for summer feeding when the pasture is short. I have always made the general assertion that where a man has six cows he could afford to have a silo and with ten cows he cannot afford to be without one. I would recommend a 10x30 or 35, depending upon the location. That is, if you get a silo in a place where it is badly exposed to the wind it might blow over. Of course a cement silo would not blow over.

Mr. Lillie: Would it be practical to have a silo smaller than 10 feet in diameter?

Mr. Hull: No, I do not think it would.

Mr. Lillie: Would a silo 10 feet in diameter be pretty large for 10 cows?

Mr. Hull: It might, but if you got much less than 10 feet you get a larger percent of waste in your silo, there will be a larger percentage of deterioration. Nine feet may be all right but when you get much smaller than that you lose a larger percent. The ensilage will not pack as well and this means deterioration around the sides. There is a larger percent of it at the top because it will spoil around the sides of the silo on top a good deal further than it will in the center of the silo.

The Chairman: How large is your silo, Mr. Myers?

Mr. Myers: Nine feet.

The Chairman: Do you know how large Basset's silo is?

Mr. Hull: It is not very tall, I saw it the other day.

The Chairman: Six feet in diameter? I was trying to remember. This is quite an important question and one that has puzzled me a great deal because it is a question that I have been trying to answer too and do not know anything about. How small can we have a silo, and have it practical? That is one way to put that question. A great many of you probably know Mr. Bassett, secretary of the state horticultural society, because there have been state horticultural meetings up in this section. Mr. Bassett wants to keep only a few cows and he has asked Mr. Hull, myself and others how small a silo he could build and have it practical, and we all said we would not recommend less than 10 feet. I was down at Fennville this winter and he said "Contrary to all you fellows I ordered a silo the size that I thought I would need," and it seems to me it is six feet in diameter. He had to have it made to order and he thinks it is the nicest thing that ever was. He filled it and has nice ensilage that keeps perfectly he informs me.

Mr. Hull: Personally I never had any experience with those, but the silo literature has all condemned that, and there is a line of reasoning; you can see you would lose a larger percentage of ensilage.

The Chairman: It is something we had no facts about. If that is the case it would be entirely practical to have a silo for six cows, but of course it would cost lots of money in proportion to its capacity. It would be more expensive than to have a silo for 20 cows in proportion.

Mr. Hull: There is no question but you would have a larger percent of waste.

The Chairman: If none of it spoils how will there be a larger percent of waste?

Mr. Hull: There will be a larger percent spoiled; it will cost more per ton to put it up and more per ton as an initial investment. It is possible though that the increased advantages of having a silo would overcome that so that it would be practical.

Question No. 2. Would it be practical to have a cow testing association testing cows every two months?

The Chairman: I would not think it would. I would not want to put the time off longer than one month. I think the cows should be tested twelve times a year. I would not want to make testing periods any further than that. You might get some idea and it might be practical so far as selecting good cows from poor ones, but if you are going in to test cows I think you should test them once a month, and certainly if this idea of registering grade cows, that Mr. Taylor brought out, I do think it would be out of the question to have six tests each year.

Mr. Powers: Did you not test your cows twice a year?

The Chairman: I always weighed the milk one day in each week and then calculated, testing the cows four times during the period of lactation.

Mr. Powers: Could they not weigh their own milk and have it tested six times a year?

The Chairman: They can do that without a cow testing association if they weight their own milk but they are not going to get records that everybody will believe in if they do it that way. If we are going to have records, we want records that everybody will countenance, and

to do that I think it would not be practical to have the milk tested a fewer number of times than twelve in a year.

Question No. 3. Can you make good butter from a lot of strippers, Mr. Powers?

Mr. Powers: I do not know but it might be possible to do that but the grain of the butter might be inferior and the flavor might be somewhat off. I do not know that it would, however.

The Chairman: What would you say about that, Mr. Fuller?

Mr. Fuller: I hardly know. I think it all depends on the feed. I do not see, if she were properly fed, why an old stripper would make very much difference.

The Chairman: Of course a creamery would have no very accurate way of telling that because new milk cows come in and their milk would be mixed with that of the strippers.

Mr. Fuller: A good many times when butter is made on the farm from old strippers' milk, it is almost impossible to get the butter to firm up. Of course in a creamery we have all the milk mixed together so there is no trouble about that.

The Chairman: Where people are making butter at home from strippers' milk and having trouble to get the butter to firm, heating it up on the stove will overcome that in many cases. I know in the spring the Michigan Farmer receives lots of inquiries as to why the butter does not firm. We generally guess they are milking strippers and tell them to put the milk on the stove in pans and let it come almost to a boil, then set it away and the cream will rise and then they can churn it. Almost invariably we receive replies saying they have good luck with that method. Of course there comes a time when the milk is not considered good for food but up to that time I hardly see how it would affect the flavor unless you carried it along up to where the cow commenced to spring udder again for the next period of lactation.

Mr. Hull: There is a change in the character of the milk. There is greater viscosity about that milk. That is what you overcome by heating, is it not?

The Chairman: I suppose so, yes.

Question No. 4. If not, can you make good butter where the milk of the strippers is mixed with the milk of fresh cows, to any great extent.

The Chairman: I think that has been answered because the creameries can make good butter and the milk of strippers is mixed with the milk of fresh cows. Every creamery has that experience in the fall anyway, and many in the spring in a territory where cows freshen in the spring.

Question No. 5. Is it advisable to have water where the cow can drink any time she may desire, Mr. Hull?

Mr. Hull: I think so, yes. I do not think there is any question but that the cow will do better to have water before her so she can get it in the quantities she wants. She will drink less and drink more frequently. The only difficulty is that the water is apt to get foul once in a while, so we must watch for that.

The Chairman: If you have covers on the pail that come down every time she takes her nose away, that prevents that to a large measure.



Some people have cement mangers and change the water twice a day. A great many have an individual bowl for each cow and so far as I know they are all satisfied. In my own stables I have the individual bowl and I can say it pays for the expense of putting it in.

Mr. Smith: Does the water circulate through the bowl all the time?

The Chairman: As fast as they drink it out it flows in. It is governed by a float valve in one end of the stable.

Mr. Smith: I know a man in Pennsylvania who has an individual float and has the water flowing in all the time.

The Chairman: Of course that would be a great deal better yet because that flowing water would be better, but most of us have a pump with a windmill and do not want the water wasted.

Question No. 6. Does it pay to feed sweet corn fodder and pea vines to dairy cows? Mr. Myers; how would you answer that?

Mr. Myers: I have had no experience with that, I refer it to Mr. Taylor.

Mr. Taylor: About sweet corn I cannot say, but I am satisfied that pea vines are among the very best roughage that we have. They contain a high protein content and I have found it a very palatable feed for milk cows. I consider it an excellent food.

The Chairman: Do you make those pea vines into hay or silage?

Mr. Taylor: Hay at our place.

The Chairman: Either way they make a good feed for the dairy cow. I was up at the Menominee County Agricultural School last week and went out to what they call "Pine Hill Farm," the farm of Congressman Sam Stephenson of Menominee. I saw there a large silo half full of pea vine silage that seemed to me would be delicious food for the dairy cows. It smelled good and tasted good and there is no question but it was good. Pea vine hay cured as clover hay makes excellent food for the dairy cow. Sweet corn fodder, I presume that is where the sweet corn is taken to the factory and the fodder fed to the cows. Of course it would not be a real valuable feed like pea vines because it is not so rich in protein, but if it is properly cured it makes a good feed for dairy cows. You cannot afford to throw it away. You can put it in the silo and make good silage out of it if you cut it up when it is green, but do not allow any of it to be thrown away because it is good feed.

Mr. Smith: The farmers near Kent Station consider sweet corn fodder more valuable than field corn fodder.

Mr. Taylor: The first year I filled my silo I had sweet corn fodder and I put some of it in the top of my silo as I had room for it, and I found when I came to take it out it was full of acid.

Mr. Hull: It is not the right thing for silage.

Mr. Smith: When did you put it in? Before it had frosted?

Mr. Taylor: Yes it all went in before frost.

Mr. Smith: I understand Mr. Ode had some experience with sweet corn silage and he let it get frosted, and likes it better than field corn silage.

The Chairman: Even if it is not very green it ferments more. We put some Evergreen corn in the silo one year and it was my experience

that even where matured when put in, it was more sour than field corn or Flint corn. There is so much sugar in it that fermentation takes place.

Question No. 7. How often should we wash the hand separator?

The Chairman: How often should we wash our hands? How often should we wash our dinner plates? It seems to me it would be just as fitting to ask those questions as to ask how often we should wash the hand separator. I wish I were well acquainted with the ladies here, I would like to call on some of them to answer that question. Of course Mr. Fuller is going to talk on the subject of care of hand separators and separator cream and I do not know that we had better answer that until after he talks. If he does not answer the question we will answer it further.

Question No. 8. Does the present price of butter warrant paying \$30 a ton for bran?

The Chairman: That depends on how good cows you are feeding the bran to. If you have cows that will take the feed you are giving them and return you \$3 worth of milk for a dollar's worth of that feed, it is a mighty good investment to pay \$30 for bran if you cannot get it for less. You can feed an expensive feed and make good profit. But if you have a cow that takes a dollar's worth of feed and gives 50 cents worth of milk, you do not want \$30 bran. I think that is a fair way to answer that question.

Mr. Hull: You cannot pay that if you can pay \$20 and get some other feed that will give more protein.

The Chairman: Some people have a notion that they must mix bran in a ration anyway. There is more ash in bran than in gluten meal or oil meal and they are sure in the long run that a cow does better with a portion of bran; but, as Mr. Hull said, you can buy protein in dried brewer's grain, in cottonseed meal and oil meal or something of that sort cheaper than you can bran at present prices, so in a general way I would say you cannot afford to feed much bran at the present time and it would not make much difference whether butter was fifteen cents a pound or thirty cents. But answering it in the way I think it is intended, I think it depends on the cow you are feeding. If you have the right kind of cow do not worry about the cost of feed and if you have a poor cow you want to make bologna sausage of her anyway. Probably Mr. Hull will tell you what to do with those cows before he gets through here.

Question No. 9. Is the silage any good to feed in June and stop feeding now?

The Chairman: I suppose it means if a man has more silage than he wants to feed this spring can he stop feeding now and begin again in June. He certainly can for silage is as good in June as it is now. A good silo filled with good mature corn will have silage that will keep indefinitely, and I know where it has kept ten years in a good silo. If you have fruit in a good can and it will keep six months, it will keep six years if you do not allow the air to get to it, so you can preserve this silage indefinitely and feed it when you so desire. Of course a small portion on top will spoil but that will form a mould over the top, hermetically sealing it and keep the air away, and then decomposition cannot go on further.

Mr. Smith: How about covering with sawdust? I have seen that done to a large extent?

The Chairman: That will preserve the silage. The only question is would it be cheaper to go off and draw sawdust and put it on there and wet it down, or let a little of the silage rot down.

Mr. Hull: Smooth off the top of your silo when you get through filling and put building paper over the top, put chaff or cut straw or something of that sort on top of the paper. I used to think, when we first began to fill the silo, that we ought to have some cheap material to put on top, some marsh hay, sorghum, or something of that sort, but you cannot raise anything on the farm cheaper than corn and what is the use of going off four miles to get marsh hay to put on top of the silage when it would cost more than to let a portion of it spoil? So tramp the silage three days in succession, put a bucket of water on every three feet of surface, and you will have five or six inches spoiled.

Question No. 10. What is the highest per cent of over run ever found in dairy butter? Mr. Hull.

Mr. Hull: I made the assertion out here that I tested some butter in New Era that showed 78 per cent overrun that was pretty good. Of course I do not know how that butter was made; I know the lady who made it is not here or I would not tell it, but that was an actual case. While I do not know how it was made the butter resembled and smelled more like Dutch cheese than like butter and it looked to me as though someone had this viscosity cream and had churned and churned and became discouraged and let it set until it wheyed off and then sold it for dairy butter. That was the only reason it could be called dairy butter, because it sold for that.

The Chairman: Most dairy butter has a small overrun.

Mr. Hull: You will find quite a lot of it is low and then once in a while you will find a batch of dairy butter that exceeds the legal content of moisture. It is pretty hard to tell what you will find in dairy butter, that is I mean in the way of moisture.

The Chairman: In this sample you took, that was not all moisture, was there not a lot of casein?

Mr. Hull: There was half as much curd as there was fat. That is what led me to believe they let it whey off.

The Chairman: Mr. Fuller was not able to be present this afternoon so it was thought best to let him speak this evening. Therefore, we will transpose the program and call on Mr. Fuller now to present this topic

## CARE OF HAND SEPARATORS AND HAND SEPARATOR CREAM.

MR. E. M. FULLER, MONTAGUE.

(Mr. Fuller had prepared a paper and had given it to the stenographer. On arranging the matter for the printer I found his paper missing, the stenographer is unable to locate it and M. Fuller is unable to reproduce it, so I have been obliged to leave it out. Sect'y.)

The Chairman: Mr. Powers is down to lead in the discussion of this paper. I think many of you know Mr. Powers is an old creamery man and he ought to know something about this.

### DISCUSSION.

E. S. POWERS, RAVENA.

Mr. Chairman, Ladies and Gentlemen:

I am a little timid to speak on this subject. I know when Mr. Fuller speaks about patrons taking care of their cream to whom he is referring, because you ladies know just how good a housekeeper the average man is. Did you ever go away from home and leave him to take care of the house for a week until you got back, and then did you not find everything in nice shape? I am afraid not, but as Mr. Fuller has stated the situation as it exists at the present time it is certainly an aggravating condition. We hear the cry of poor butter all over the country and it is all blamed to the patrons and to the hand separators, but ladies I want to give you a little encouragement, some of the creameries are to blame for this poor quality also.

As Mr. Fuller said, we cannot make a good piece of butter out of a poor quality of cream, and someone is to blame for this lack of care of the separators. I believe if the parties who instructed the patrons in the use of the hand separators and told them it was not necessary to wash them night and morning after each separation, had only lived a thousand years ago and introduced this same system of not washing dishes after each meal they would have saved you ladies a tremendous amount of work. Think of it, how nice it would be at night when you get through with the supper, if you could take a dipper of water and put it on this plate and on that one and let them stand until morning, in the morning empty the water and say "John come up and take your hash." That would be easier, a good deal easier than the way you ladies do, washing your dishes after each meal. I do not think it is any worse to leave your dishes unwashed after each meal than to leave your separators unwashed after each separation. Some people think if they run a little water through the separator it is clean but, as the previous

speaker said, let that separator stand on a hot night in summer, I do not care how much water you put in it, and it is worked up pretty well by morning with the yeast in there, and that yeast is sure to develop in your cream at some period during the life of that butter. That is what the creamery men are fighting today, is that unclean flavor.

There is no question in my mind but there can be just as good butter made from hand separator cream as there can from whole milk cream, if the creamery man will do his duty at the creamery and the patrons do their duty in handling the cream, but the patron must bear in mind that bad butter is sure to bring a poor price and it does not make any difference if the creamery man pays a certain price for the cream, if the butter of Michigan does not hold up and we receive lower prices for it, in the end it will come out of the pockets of the producers so consequently the farmer is losing money in the long run. It certainly will pay to try to improve this condition of the hand separator cream.

I always thought that it was a small matter, after the milk was separated, to wash the separator. It does not seem a very big job or a very hard one. I have had women tell me they preferred to wash their separators after each separation, because there is a scum there that sticks to the bowl and if that is allowed to dry on it is a job to get it off, while if they are washed immediately after being used and that scum that sticks to the bowl removed it will be a small matter, if you do it directly after you run the milk through.

I am sorry to say that in the farm homes, as well as in the creameries, we find a little lack of regularity, a little lack of system, and that will put your work behind so you cannot do those things and everything is in confusion about the house or about the creamery. When I went out to Mr. Fuller's creamery and looked around I said to myself "Here is a clean buttermaker," and I thought there must be a woman in that, and there certainly was, but at the same time I believe if Mr. Fuller had full charge there he would keep things in the right way anyway. But if one has a good system in the house or in the factory of doing things regularly, for instance cleaning the separators immediately after the milk is run through, it will make the work easier. After you are through separating the milk put water in the separator, take the parts off and put them into a pan of water with a little Wyandotte or some other washing powder in there, also put your bowl in there and you will find it is not a hard job at all to wash the separator. The same system is necessary in a creamery. I have been in creameries where all the utensils were allowed to lay around until the milk had dried on them and it makes it hard to ever get them clean. I do not believe we have any farmers or dairymen that intend to sell unclean cream but they do not think a little negligence does any harm. I have had my patrons tell me it did not make any difference if the cream is sour because I had to sour it after I got it to the creamery, but if your cream has begun to sour before it leaves the farm the buttermaker cannot control the cream, and he must have control of his cream to produce the right kind of flavor and make the right kind of yeast, as the ladies would call it in making bread. The way the creameries are situated today, if the buttermaker can get good cream he can control it.

It looks as if the hand separator had come to stay and we as buttermakers and the farmers and dairymen as patrons have to work

together so this thing can be worked out and good butter made out of hand separator cream.

I think we can get more out of this subject, if we have any more time, by a general discussion than for me to say anything further in regard to it. I thank you.

The Chairman: We have a few minutes we could spend in a general discussion of this topic. Has anyone anything to say on the subject?

Mr. Smith: This is a question that I have studied very seriously during the past winter and fall in different sections of the state of Michigan and I beg to differ somewhat with the speaker who has just preceded me. I really do not believe that we can get that much desired fine flavored butter out of hand separator cream. I have been a friend of the hand separator but as I have found conditions prevailing as they are at the present time I have grown somewhat cold towards that machine, and I have felt a little bit sorry that its use has become so universal.

The first secret of making good butter is to get your curd fat out of the milk serum just as quickly as possible, from the time it comes from the udder of the cow, but when that separation is done on the farm in nine cases out of ten the product is not brought in in good condition. I was discussing this subject with a hand separator agent one time and I told him, when he said that he was going out impressing upon the farmers' minds that if they washed their hand separators once a week it was all that was needed, that that machine needed to be cleaned every time it was used and immediately after it was used, and he answered "I want to sell my machines. If I told a woman she has to wash that machine every time she uses it she will not buy it, because it makes a lot of extra work" and she is right it does. It is work to clean that machine and clean it properly and on the average farm it is cleaned with the dish cloth, which is one of the things which is not right. It should be cleaned thoroughly with a brush and really should be sterilized, but on the average farm they are not equipped to do sterilizing.

Last Fall the Dairy and Food Department sent us a lot of books. I have a lot of good literature that is worth any dairyman's time to read, and we sent out a great deal of this last year. Some of the separator cream came a great distance and the farmers did not deliver it themselves, so we cleaned their cans and put some of this literature in their cans, and the next time the cream was received the pamphlets were still in the bottom of the cans. Those cans were hauled back through the dust but you see were never rinsed out, so how can a buttermaker make good butter out of stuff that is bound to come in in poor condition under such circumstances. I do not care how a buttermaker is equipped or what efforts he makes to overcome these things, if the cream is not right he cannot make it right. Furthermore, in one can of cream there are more bacteria per cubic centimeter than in a can of milk, under similar conditions, and when those bacteria once get a hold you will have trouble to destroy them. I have made butter in many different ways pasteurized and unpasteurized, and I found the same difficulties confronted me at all times when we went on the market, so I would like to see more whole milk patrons. I believe it would be better for the farmer and put more money in his pocket. This has been proven in some localities where I have been this winter, where the creameries are

making nothing but a whole milk product. Watervliet is one place and Coloma another, where they will not take a pound of hand separator cream, and the farmers there are amply repaid for the expense of getting their milk to the factories.

The Chairman: Of course it is all right to say you make better butter out of whole milk than you can out of hand separator cream but that does not stop the use of the hand separator. It is with us and it will stay. Mr. Smith can go out and talk to all the farmers in this county and he cannot stop them from buying hand separators; they are going to have them and the only thing to do is to get the farmer to take better care of those separators and take better care of the hand separator cream, so we can make better butter out of it. This is a practical question because we are not going to get the farmers to send whole milk to the creameries. I fought the hand separator when it first came out but you might as well try to sweep the waves of the Atlantic ocean, like Mrs. Paddington, as to prevent the use of the hand separators. And I say tell your patrons to get the hand separator and you will take their cream, but tell them they must take good care of the hand separator and they must take good care of their cream.

Now I think all those people are right. Mr. Fuller and Mr. Powers say you can make as good butter out of hand separator cream as you can out of cream that is skimmed at the factory, and I think they are right. I do not see why you cannot. If they milk the cows on the farm, run the milk through a separator and that separator is clean, if it is run into a clean can and the cream is cooled and kept cool until it gets to the factory, and is delivered at the factory we will say every other day in the winter time, why is not that cream good?

Mr. Smith: It might be if it was kept perfectly clean.

The Chairman: The creameries are not perfectly clean either. You can keep it clean if you stir it a little while you are cooling it to get the animal heat out, and then you can put the cover on and keep it so no dirt can get in it, and it will not injure it. I believe lots of farmers spoil their cream because they do not look after the temperature of it. Even if they wash their separators they skim the cream and then do not take pains enough in cooling it, and even if they cool it as soon as it is skimmed they do not keep it cold. It does not do so much good to set that can of cream in cold water and stir it and get it nice and cold and then let it warm up again the next morning or over night. That is where the trouble comes. You may not keep all the bacteria out but if you cool it down they will work very slowly for the temperature is too cold, and as soon as the cream warms up they are growing because they like to grow, it is natural for them to do so. What you want to do is to keep that cream cold after it has been cooled and that is where a great many farmers make a mistake, they do not keep it cold. I read of a creamery man who took some pains to educate his patrons in a western state along this line. He advised them to get a tank or a barrel, saw off a portion of it so it would not be too tall so they could set the can of cream in the barrel of water; then have that connected with their windmill and the water pumped by the wind mill, ran through that tank and into a trough for the stock, and that will not injure the water for the stock. If you have several cans of cream have a tank, all the water pumped from the well goes through

this cream tank and that keeps the cream in good condition but if you simply set the cans in tubs and forget to change the water, letting it get hot, your cream will warm up and get in poor condition.

Of course anybody knows that after milk is run through a separator that separator ought to be washed. There is no use in arguing that with a lot of Yankee farmers because they know it. Perhaps they do not all do it. I have to depend on a hired man to wash my hand separators and I give the man that attends to those things a dollar a week extra if he will wash that separator at night. I do not know that he does it every night because I am not there but I know he ought to because he has agreed to do it, and when I get him to agree to do it and pay him a dollar a week extra for doing it, I think I have done my share. A neighbor told me he does not wash it every night, but I do not know whether he does or not. I know if the chores are a little late in haying time he might forget it.

Is there anything else to be said on this subject? It is an important question. Is the creamery man from Shelby here? We would like to have him say a word on this subject.

Member from Shelby: I did not come to make a speech and I do not know that I have anything to add to what has been said but I do emphasize the fact of cooling this cream immediately after it is skimmed. That is where I make my biggest point to my patrons, is to cool immediately and stirring five minutes after skimming, which is worth more than an hour or two some other time in keeping undesirable flavors from the cream. I advise my patrons to skim in a pail and set it in cold water while they are skimming. I think this cools the cream as rapidly as any proposition I have been able to find. If they skim in a pail, set the pail in cold water, keeping stirring it meanwhile, afterwards keep cool and stir for five or ten minutes, my experience has been that I have received a better grade of cream in that way than by any other way I have ever tried.

The Chairman: Do you get all your patrons to do that?

Answer: I do not know, I ask them to do it. We had an instance last summer of a patron that only delivered twice a week. He had ice, cooled his cream thoroughly, then put it into a cream tank and put on the top and set it in a half barrel, and we never got any smothered flavor whatever. His cream came in in nice condition because it was properly cooled before he put it away and then he kept it nice and cold. I believe it would have kept a week and not got sour.

The Chairman: Ice cream manufacturers sometimes cool their milk and keep it a week before they manufacture it.

Mr. Smith: That is another proposition. If the patrons held cream that length of time we would not like it.

The Chairman: Sometimes they get more cream than they want and they put it into the freezer and hold it.

I know positively that hand separator cream can be so good that it can be delivered a week in the winter and three times a week in the summer and make butter that will score extras. If you have good clean dairymen, clean cows, clean utensils and clean separators, cool the cream as soon as it is separated and keep it cold, not mix warm cream with cold cream, have the cream of the same temperature before you mix it, take good care of it and bring it to the creamery, good



butter can be made out of it. There is no question about that, but if your dairymen are not clean and do not take proper care of the cream you will have bad cream and cannot make good butter out of it. It is the duty of the farmer to do those things. It does not cost very much; it only takes a few minutes more time to keep cream in good condition and deliver it in good shape, and it seems to me that is about all there is to it.

If there is nothing further we perhaps had better pass on to the next subject, "Success and How to Attain it" by Mr. N. P. Hull.

### SUCCESS AND HOW TO ATTAIN IT.

MR. N. P. HULL, DIMONDALE.

Mr. Chairman, Ladies and Gentlemen:

I might say that I have prepared this address for an hour and a half time, but if you are good I will not give you all of it.

I think I can start out with the assumption this evening that we all want to succeed. I do not know that I ever met a man, woman or child but had some sort of ideal, or some sort of ambition. Some of them, to be sure are not very lofty; some men there are whose greatest ambition in life is to have a dog that will fight a little harder than any other man's dog, or a horse that will run faster, or something of that sort, but you see even the boy and he will be looking forward to copying some man because he thinks that man has succeeded, his ideal from his viewpoint and he thinks "There is a man who has succeeded," and he emulates that man, wants to succeed. I am going to be brief with this and I am going to start out with the assumption that we all want to succeed.

The next proposition is we all ought to succeed. No people have ever lived that enjoyed during their lives the blessings that the men and women of America are enjoying today, so many blessings that have been obtained by the hard work, by the struggles and life blood of the people who have gone before them, as are we Americans enjoying. And from the very fact that we are living and enjoying the fruit of other men's labors and exertions, that have been handed down or bequeathed to us, dodge it as we may, we are under moral obligations to hand down to our successors conditions relatively as good as we found, and that means absolutely better conditions than we found because with the great onward march of progress of today the men of tomorrow must enjoy greater liberties, must enjoy greater blessings than the men of today enjoy, and from the fact that we are enjoying the fruits of other men's labor we are bound to hand down to those that come after us the fruits of our labor, and if we hand down that which we are under moral obligations to hand down to them, it means that the men of today must obtain greater results than the men of yesterday obtained. So we all want to succeed, we all ought to succeed.

The next proposition is we all can succeed. Someone has well said

that "America spells opportunity" and it is true. For never has there been a time in any nation when a boy, born in any stratum of society, could, through his own exertions, place himself at the top round of the ladder of success as he can in America today. Through conditions and blessings today a boy, born no matter where, can take his life and make of it whatever he will, make of himself all there is in him to be. I say again that America spells opportunity. We all have this opportunity but it is necessary that we improve this opportunity. Just the fact of our having the opportunity will never make a success of our lives. We must use it. There may be one of the most fertile fields in Michigan just over the way, there may be on that farm the best seed obtainable, but the fact of that fine field and seed being there, while it makes an opportunity, it will never make a harvest. Some man must use that opportunity and incorporate the seed with the soil, handle it rightly, and then he may succeed in having a harvest, but it will be because he has used the opportunity at his hand. There may be just over here somewhere in the little village of New Era boys and girls grow up who never succeed, not because they have not the opportunity but because they do not use the opportunity. So let me repeat again, we all want to succeed, we all ought to succeed and we all can succeed.

We were all born into this world with certain hereditary tendencies, certain natural abilities and certain environment. These tendencies, this ability and these environments determine the site upon which our life structure shall be builded, and upon this site, without previous experience, without training, each one is his own architect, his own master builder. We must each go on erecting an edifice as long as for us time lasts and when the day shall come that the angel of death shall proclaim that for each one of us time shall be no longer, some will have erected an edifice that will have reached up into the sunshine, that will be a monument to himself and a glory to himself and to his family; others, when that day shall come, will find themselves still grovelling upon a level with their foundations, their building material lying scattered and wasted about them, a reproach to themselves and a dishonor and disgrace to their friends and families. We all want to build so that when the day comes for our final accounting we shall have erected a life structure that shall be an honor to ourselves and glory to our friends and families.

I am sure if we are to succeed there are certain lines we must follow, and the first of those that I want to mention is that we all ought to get an equipment for our life's work. I believe that God Almighty knew what he was doing when he made a man. He gave him strong arms and strong hands because there was work to do in the world and we have to do our part in that world's work, but I believe He knew what He was doing equally well when he made that part of his anatomy above his ears and put brains therein. I suppose God Almighty expects a man to use those brains to more intelligently direct the labor of his hands, that the labor of those hands might be of more value to him; and the greatest difficulty with a large number of men that are not making a success of their life's work in the world is they have never given their intelligence an equipment that enabled them to wisely direct the efforts of their hands. A gravel train was standing on a side track and 150 men were shoveling gravel on the cars. A man inquired

of a bystander what those men received and was told they received \$1.50 a day. Then he asked "How much does the engineer get?" "Five dollars a day." "He is not doing as much work as those men shoveling gravel." "No, but that fellow is not being paid for what he does, but for what he knows." The man, that had intellectual equipment that enabled him to know how to handle the levers of that big iron horse so he might stop it or start it at his will, was being paid for the intelligence of his brain that directed his hand in such a way that made the effort of that hand of more value to him.

Washington Gardner, the congressman from our district, was in the upper peninsula and visited the Calumet & Hecla Mining Co. He went down in the engine room. On one side is an engine capable of exerting 5,000 H. P. and over on the other side is an engine capable of exerting 7,500 H. P., said to be the largest engine in the world. A man was sitting in the corner whittling a stick and Mr. Gardner asked, "How much do you pay that man for whittling that stick?" "\$7.50 a day." In the blacksmith shop Mr. Gardner saw a long row of men with coats off, sleeves rolled up and perspiration steaming from their brows, beating red hot iron. He asked, "How much do those fellows get?" "Well, we pay them \$3.50 a day." Mr. Gardner said, "I believe I would rather whittle a stick for \$7.50 a day than pound iron for \$3.50." That man sitting in the corner was not being paid for whittling a stick really. The idea was that there was that great 7,500 H. P. engine, the means of forcing the fresh air down one and a quarter miles into the bowels of the earth and enabling those men working there to live, and were one little bit of that big piece of complicated machinery to get out of order and that engine had to stop, the fresh air would be shut off from all those men. So that man sitting in the corner was being paid \$7.50 a day for whittling that stick. He was not paid for the work he was doing but was being paid for what he knew how to do. That man was paid \$7.50 a day because if that engine stopped he knew what to do. He was being paid for the intelligence that gave his hand the cunning to know what to do for the engine to start it going again as quickly as possible. I might give many illustrations along this line but my time is limited. I just brought up these incidents as an illustration to show that it is not the labor of the hands. Those men that were pounding iron were doing more work than the other man, who was doing little work but receiving a good deal more, not for the labor he did but for the thing he knew how to do.

A certain boy went to an agricultural college. His home was in the fruit section and he took a course in horticulture at the college. He went to his father's home, where there were ten acres of apple orchard, and he said, "Father, let me take that ten acres of orchard and prune and spray and take care of it." His father said "You have the big head. "You think you know more about growing apples than I and I have been at it a good many years." The boy was a chip off the old block and he said "It looks as though you made a mistake somewhere,—either you made a mistake when you sent me down there to the college for to learn this stuff or you are making a mistake in not letting me use it." The old gentleman said "Well, boy, take the orchard and try it for a year." The boy took the orchard, pruned and sprayed it and made more off those ten acres than his father had made off the entire farm in ten

years. It was because he had the intellectual equipment that enabled him to use the effort of his hands to better advantage. The first great thing, the first great step in making a success of our life is to get the mental equipment that enables us to intelligently combine the energy of our hands with our heads that the time spent with those hands shall be more valuable, that we may be paid for what we know how to do as well as the actual labor we do.

You may say that every boy cannot get a high school and college course. I do believe that is desirable but many a man is getting intellectual equipment, many a boy who comes and works in this country of ours is getting intellectual equipment better than is gotten in the high school and colleges. The man that observes the thing he sees about him and uses the opportunity that is at hand gets an equipment. Many a man on the farm today by close observation has learned the value of different things on the farm. He knows what the cows are giving, if you please, as we are at a dairy meeting I will give you an illustration along that line. I know two men that started in ten years ago and made up their minds to carefully weigh and test their milk and know what each cow was giving, used their brains with their hands. They found at the end of the first year they had an average production of 184 pounds of butter per cow. They kept up this method for eight years. At the end of eight years how much were they getting per cow? Three hundred seventy-six pounds of butter per cow. If they made any profit at all on 184 pounds of butter per cow what kind of profit were they making on 376 pounds of butter per cow? They were making one year of their life in the dairy business worth as much as ten years when they were getting 184 pounds, and by the result of the brain power in the effort of their hands they were making one year's work of the hand worth as much as ten years heretofore. The effort of their hands with those good cows brought as much as ten years of that effort with poor cows.

We might go on multiplying those instances, but the first proposition is to get an equipment, and the second is to use it. A boy may dream through his school days and college days but when he gets through there and goes out to battle with the world he must wake up, he must not only do but know what to do, must not only perform tasks but be his own taskmaster. I have heard Dr. Angell, the head of our state university, say that what the young men of America and of Michigan needed today was to be taken by the shoulder and given a thorough shaking up and awakened to the possibilities of the life of an American boy of today. That is what a great many of us need, a wakening up, recognizing the fact that we are fully grown Americans and owe something to ourselves and to this nation in which we live and to use the equipment that we have.

You have probably all read of the boy Abraham Lincoln and how as a young man he visited New Orleans and on his way back he attended a slave auction, and he saw a slave mother about to be separated from her children. He saw the sorrow of that mother as she bade farewell to those children, never expecting to see them again. The mother's sorrow struck Abraham Lincoln and enthused the young man as nothing ever enthused him before, led him to strike the first blow for the free-

dom of the slaves, he became president of the United States and his name is enrolled at the top of the scroll of American heroes today.

I knew a young man back home, one of those tall, thicklipped fellows that stuttered. He took a notion to a girl that lived west of us and he thought so much of the girl that he thought she must like him. He told her so and intimated that he would like to go into a life partnership. She made light of him and gave the idea to that young man that she thought such an arrangement as that would bring her downward in the social scale and she did not propose to step down but wanted to step up. This young man told me this when we were in college. He said "It was three and a half miles home and I did not care anything about walking home but I remember when I got home that my fists were clinched and I thought that thing over and I made up my mind that I would make something of myself, that I would live to show that girl that she would have to look up in a social way to see me." That was something that aroused that young man, it was such a shakeup as Dr. Angell said the young men of America needed. That young man commenced attending school at the district school, worked between times until he got enough to let him graduate in the agricultural college, took a post graduate course in another college, went from that as a teacher, and that young lady today would have to look up a long way to see President McKinney, President of the State College. If only a few more of us got a rousing shaking up it would be a good thing for us.

The first thing is to get equipment, the next is to use it, the third is, it takes work to succeed. No man ever became a great physician, no man ever succeeded as a lawyer, no man ever succeeded as a minister of the gospel, no man ever succeeded as a farmer that was afraid of good hard work. Perhaps not to go out and pick stones, perhaps not to wield the ax or pull the saw, but it takes work; it may be brain work, it may be the labor of concentrating ones attention until he masters a thing, but it means work, and no man has ever succeeded or will succeed that is afraid of work, that is not willing to stand by a proposition and dig it out.

We have many illustrations along this line, and I will give you one incident that seems to me to illustrate this idea of work. First let me say I was down in Lenawee county a few months ago doing institute work and a man said "You have told us how to make a living by working; tell us how to make a living without work." I said "If I could make it possible for all the men in Lenawee county to make a good living without work and I gave you a choice tonight, that you might make a choice here for the people of Lenawee county, that I would make it possible for them to live without work or would take the two oldest children from every home in Lenawee county, which would you take?" He never thought of it that way, of course he did not choose but I said "You would make a mistake if you accepted the proposition of my making it possible for all the men of Lenawee county to make a good living without work, because where would Lenawee county be inside of twenty-five years if any man used the possibility of making the people of that county able to make a good living without work." I will illustrate that by a story. A man walked in a line up to a ticket window in a

depot in New York City. -It was almost time for the fast express to leave for Chicago and many were waiting in line to get a ticket for the train. This man asked for a ticket to Chicago and was told the fare was \$22.00. He said "I have not \$22. "Well you will have to pay \$22.00 for this ticket." "I have not \$22.00, I have only \$4.00." The clerk said "Well you will have to pay \$22.00 if you get this ticket." The man said "I have only \$4.00, where can I go for \$4.00" and immediately fifteen men that were waiting in line told him where to go, and it was not to a summer resort either, but it was where ninety-nine out of one hundred of the men, women and children of Lenawee county would have gone if someone had made it possible for them to make a good living without work.

This other illustration of the idea of work, because I know it has been an evil of the American boy of the past, it is an evil of the American boy of today, that too many feel that there is something degrading about good hard work. They have an idea that they ought to be gentlemen and that hard work, good honest toil, is something a little below the status of a gentleman. I believe there is no creature on the American soil today that is so despicable as the American dude, the fellow who will not work. This illustration that I will give is in regard to three men who were shipwrecked. It so happened that they drifted upon an island, where the inhabitants were only partly civilized and it was one of the customs of this island that if there was anyone on that island who could not do something for the public good that he should be killed, if he would not work and do something to help himself and the people of that island. Those three castaways could not understand them so they were kept for some time until they got some idea of the language and could understand by words and signs. Then they had a meeting of the wise men to determine the fate of those three fellows, and calling the first of the castaways asked "What can you do?" "I can take the trees growing here and can shape them into homes better than those you now have." They said "This fellow can do something so we had better let him live." They took the next fellow and said "What can you do?" "I can take those trees and shape them into vessels that will sail over the seas." They called the other fellow and asked "What do you do?" "Oh, nothing, I am a gentleman." They did not know what a gentleman was, but they begun to believe that a gentleman was a fellow who did not work, who believed work was beneath him. That was new for those people and they held another meeting of the wise men, and what do you think they made a gentleman do on that island? They made him feather breeches and set him to hatching eggs. I have often thought that if the American dude had a pair of feather pantaloons and was made to take the place of an incubator or an old hen he would do some good in the world.

We should not only be willing to work but if we want to make a success we should be willing to start at the bottom. Too many of the young men of today, if they go to high school or to college, think they are really a success, but they must use this equipment and should begin at the bottom if necessary, and learn the business all the way up. Two young men graduated from a mechanical college, they were ambitious to become ship builders. The president of the college gave them some letters of introduction to the manager of a big concern of this char-

acter, so one of the young men said "I will go down and introduce myself and get some positions for us, or for myself at least." He went down and, after some preliminaries, was admitted to the office of the general manager and submitted his letter of introduction saying "I want a job." "What do you want?" "I want to be superintendent of construction." "All right," the general manager said "I will put your name down and when we need a new superintendent of construction we will send for you. Good day." This young man went back and said to the other fellow "There is no use in you going down there looking for a job. I could not get anything." The other said "I am going in just the same" so he went, handed in his letter of introduction and after some preliminaries were gone through the general manager asked what he wanted, and he replied "I want a job; I am willing to do anything you have." The general manager touched a button and when a boy came in he said "Set this fellow sorting scrap iron in the yard." He was a graduate of a mechanical college, had an equipment and he knew more about scrap iron sorting than any other man that ever sorted scrap iron in that yard, because he knew something of the character of the pieces of metal. Six months later the young fellow who wanted to be superintendent of construction was still waiting for this job, while the young fellow that started in the yards sorting scrap iron *was* superintendent of construction, and you can always remember that it is the fellow that is willing to start at the bottom that succeeds.

The next great thing is, do your best. Get an equipment, use your equipment, be willing to work, be willing to start at the bottom, and then do your best. Do more than you are paid for doing. How many of you have read the letters of a self made merchant to his son? If you have, you will remember his writing to his son that the orders were not coming in very fast, although as he sized it up he was doing an average day's work, getting an average number of sales, and would be able to draw an average salary. Put a little ginger in your business. You make a half way success of life turning in half sales, and perhaps if you put ginger in your equipment you can get the other half. It is my experience in life that the last half always counts. Many a young fellow is doing fairly well but not doing his best, but do your best to get the other half because it is the last half that always counts.

I remember a young fellow that had short trousers and coat, had down on his face, but when he went to class he did his best, better than he had to do. His work in college all the way through was better than it had to be; after he graduated from that college he went up into the next county and commenced to teach school. All that was expected of him was to teach reading, writing and arithmetic to those scholars. He was willing to do more than he was paid for, he was willing to do his best. He began to talk to those boys about corn, asked what per cent of the corn their fathers had for seed would grow; he invited them to bring in a few ears of the corn and they tested it, and he gave to those boys examples "If such a per cent of your corn would not grow, how much would your fathers lose from the seed corn that will not grow?" He got the boys interested in that thing. Then he got them to go out in the field and count the rows of corn that did come and see how many stalks there had no ears. Those boys became very much interested in that school because their teacher was doing more than he was paid for,

he was doing his best and he began to write some articles in regard to it. Certain people heard of this system and wrote over and asked him if he supposed that by this system of testing corn he could produce more corn on their five thousand acres of ground. He thought he could. They asked him to come to them and told him they would give him one-half the increase. He received a moderately good salary and they gave him half the increase, but he did his best when he was getting a lower salary. The University of Illinois asked him to come over to that state; the great state of Iowa that grows up in the millions of acres of corn every year, asked him to come there at an increased salary, and today the fellow that started in the agricultural college with short coats and short trousers and down on his face, is at the University of Iowa and his name is P. G. Holden, and that man is known all over the world where corn is grown. But that man did his best.

I once went into a creamery in southern Michigan where the butter-maker was not making as good butter as he ought to make. I said "Why don't you make a starter?" "I have no starter can." "You do not need to have a starter can." "Yes I know, but I am only getting \$50 a month here; if they paid me more I would make a starter but I will not for \$50 a month." There was not much use in talking to that sort of man. When a man starts out with that sort of opinion and puts his foot down in regard to it, you might as well leave him alone because he has ideas that will take him down instead of up. That fellow was in Saginaw that coming winter when Professor McKay told the butter-makers that he had more calls in Iowa for young men to fill positions in creameries that would pay \$1,800 to \$2,000 a year, and he said for only about one-half of those did he know of young men he could recommend to fill the positions. This young man said "I would like one of those positions and get \$1,800 a year." I said "You will never get it. Do you remember my asking you about the starter? That is where your opportunity was; you had an opportunity there to show those men that time that you were worth more to them than you were getting, and you turned down your opportunity." Now when it comes to this world we talk about the Missourians having to be shown, but when it comes to things of this sort we are all from Missouri, we all want to be shown, and we are willing to give every young man in America today a chance to show us, to give every boy a chance to show us that he is worth more than he is getting. We have thousands of opportunities for every young man at advanced wages a chance to climb up in the world if he can show us he is worth more, but I do not believe that young man has any reason for complaint if, when he has the opportunity to show the world that he has more in him than we know of, if he turns down the opportunity. Every boy has the right to have an opportunity and we will give him that opportunity, but if he turns it down he has no one to blame but himself. I say to you get an equipment, use your equipment, be willing to work, be willing to start at the bottom and do your best.

The next thing is stick to it. One of the greatest reasons for failure to make a success today is the young man or boy who starts out in some way to work gets to see the disagreeable as well as the agreeable sides of that work; he looks at another man's business and sees only one side of the other man's business, and he argues "That fellow has a



better business than I have," so when he has been in his work long enough to master it he concludes to climb down his ladder and try to climb some other man's, and he goes on doing that and never gets big enough along any line to attract a great amount of attention. Some one has said:

"Tis the coward who quits to misfortune,  
Tis the knave who changes each day,  
Tis the fool who wins half the battle  
Then throws all his chances away.

The time to succeed is when others  
Discouraged show traces of tire,  
The battle is won in the home stretch  
And won twixt the flag and the wire."

We have sometimes a wrong impression of success. Some associate this matter of success with great achievements. It is not necessary to make great achievements in life to make success. He has succeeded who has lived well, laughed often and loved much, who has filled his niche in the world and accomplished his task, who has left the world better than he found it, whether by an improved poppy, a perfect poem or a rescued soul, whose life was an inspiration and whose passing was a benediction.

Too often we look upon the men who have made a world wide reputation and sometimes, in the true sense, those men have not succeeded. We point to Rockefeller today as a great example of success, but, honestly, would you want your boy to be a Rockefeller, knowing today that he had a great deal more money than he and all his family could handle to advantage, a great deal more than he needs to contribute to his happiness, and feel that that boy was to become overburdened with wealth as Rockefeller, when there are a thousand young men and tens of thousands of young men, perhaps, whose lives are not what they might have been today because Rockefeller, to build up his mighty fortune, has taken the labor of the fathers and hundreds of those boys without giving them a fair share of the product of their toil? I do not believe Rockefeller is enjoying any greater happiness than many men in Oceana county.

We point out Napoleon Bonaparte as a great example of success and perhaps no man ever lived that was such a military genius as Napoleon. We think of Napoleon marching into Paris and we think we would be glad if we could become the genius that was Napoleon, but if we thought less often of the mighty brilliant history of part of Napoleon's life and did think more often of the same Napoleon sitting on the Island of St. Helena, thinking of the blood soaked soils of Austria, Spain, Egypt and Russia, colored with the best blood of his country that he might be known as the greatest military genius the world has ever seen, thinking of the tears shed by the mothers, wives and daughters in the homes left vacant, thinking that he had broken the heart of the only woman who ever loved him and put her away that he might marry another and raise an heir to the throne of the Empire that he expected to build, do you think that Napoleon was happier on the Island of St. Helena, thinking

of what it had cost him and what it had cost France in blood, in tears and in treasure to make of him a great general, do you think he was happier than the man doing his duty on a farm in Oceana county, or in any other legitimate business? The good book says "He who makes two blades of grass to grow where but one grew before is greater than he that conquereth a nation." If that is so, how much greater is that man who makes two blades of grass to grow where before none grew?

Now we all can succeed if we get an equipment, if we use that equipment, if we are willing to work, if we are willing to start at the bottom, to do our best and stick to it, and the man who does those things if he succeeds in doing no greater thing than to make two blades of grass grow where none grew, has done well, and I believe that man or woman who has built well for time has built well for eternity.

I thank you.

The Chairman: We will now ask Dr. Robinson to address us. I do not think it is necessary to introduce Dr. Robinson to this audience, and I think you will be interested in what he has to say on the circulation of the elements.

### THE CIRCULATION OF THE ELEMENTS.

DR. FLOYD W. ROBISON, STATE ANALYST, LANSING.

Mr. President, Ladies and Gentlemen:

The subject I have to bring to you tonight is a little foreign to what has been given before and you may not feel intensely interested in it. To break away from dairy topics to discuss something in general is at some considerable risk and if you get tired of this little desertation I will not feel offended.

When the world was formed probably there was no life of any description upon it, but geologists tell us it was a molten sphere. Somehow or other this earth is linked to the great center solar system with the hub at the sun, to which all plants have some binding link connecting them, which link we know as gravitation. This was discovered by Sir Isaac Newton, you remember about the apple. He discovered when a body was released from any support it has in the atmosphere or air it descends to the earth. The earth swings around the sun in obedience to the same law, the moon revolves around the earth in obedience to that same law; the whole arrangement indeed is sailing around the sun, and it takes 365 days to get around. But when this system was set in motion by some all powerful Hand, the earth and moon and other planets swung around the sun revolving themselves. At that time the earth was hot, but began to cool gradually until finally it developed a crust on the outside, just as a baked apple will when it cools and remains hot on the inside. A baked potato will remain hot on the inside but cools on the outside, a crust forms on the outer surface and this crust keeps getting thicker and thicker until it penetrates

to the interior. It has not penetrated to the interior yet, as we know in this earth. We have the eruption of the volcano, which proves to us that the interior of the earth is molten; we have hot springs, which prove to us the farther down we go the hotter it gets. Of course going from the surface of the ground into the earth a little way it gets colder but if we go a long enough distance it gets considerably hotter until we get to a molten condition.

Now when this earth began to cool and this crust form, many changes began to take place, just such changes as we are taking place now; and finally, due to the forces of Nature, such as we observe at the present time, a gradual crumbling of this rocky crust began to take place, the action of heat and cold and water, until we develop a little soil on the outside of the planet, and at the time this soil began to be developed on the outside of the planet, vegetation sprung up. Vegetation was in all probability the first form of life that manifested itself on this planet.

Of course we know all those different changes have taken years and years to produce. This vegetation in all probability started with one particular single form and according to the law of evolution gradually changed because of different conditions under which it grew, because we have a variety of vegetation in existence at the present time. Then that age was known as the carbonaceous age. We have remains of that at the present time in our deep coal mines where we have evidence of rank vegetation existing.

After this period of vegetation growth the animal appeared on the planet. It is not known how this life appeared, whether transmitted from some other planet or whether originated directly by the Founder of the universe on this planet, at any rate animal life gradually started. It is not considered that it started spontaneously because there must be some starting point to every theory that has been developed, no matter whether the present animal life developed as it has into the most perfect form, which is man, from lower animals or not. No matter whether it developed from the lower animals or not, there must have been some starting point, and consequently the theory of evolution, as it is correctly understood, is not at all at variance with the general acceptance of the Christian theory of the creation of life. The general idea of this and the scientific acceptance of the plan is not essentially different, and the general idea running through them is the same.

When animal life was formed on this planet we had three forms of life manifest upon this planet. First, the mineral life; second, the vegetable life, and third animal life.

Now mineral life exhibits its life manifestations in the forms of crystals, a form of life entirely different from the life form that is exhibited in growing trees or in the movements of an animal, but a form of life. It has certain laws that bind it to a definite form of existence, because you take a grain of salt, dissolve it in water and let it crystalize out and it will always crystalize in that shape, never forms in different shapes. It has definite regulations, laws and rules for its life's conduct to which it must adhere, just the same as the animal. The more highly organized animal, the cow or the horse, has a definite line of procedure laid out for it, not so specific, more general,

because it has a greater variety of movement, which gives it an opportunity to move in more directions than does the crystal of salt. A growing tree has more life manifestations than does the mineral because it has greater variety of movement, sways back and forth in the wind and has upward and outward movement due to its growth.

The animal life, succeeding the plant life, has a greater variety of movement than does the plant life. It can walk around, it can select its food. Plant life can select its food too but not to the extent that animal life can. The highest form of animal life that is known is man, who exceeds other known animals, because he has greater variety of movement, environment and intellect.

The atmosphere surrounding the air is composed of gasses, the two principal gasses are nitrogen and oxygen. About four-fifths of the whole atmosphere that surrounds the earth is nitrogen, the other one fifth oxygen, two gasses that are invisible. This nitrogen and oxygen differ very much in their properties. Nitrogen has no properties by itself that can commend it as a valuable gas. Oxygen has many. Oxygen is the one gas of the atmosphere which acts as a life-giving property to animal life, incidentally to vegetable life also. Nitrogen we may consider as simply a filler that is used to carry the oxygen.

Now the frost and cold and heat and rain have modified mineral life on the earth to the extent that it may be made soluble or dissolved. Something else has aided in that, and rain water dropping on the rocks have dissolved them and the action of the water has brought into solution carbonic acid. Thus water, frost and heat all together have worked to modify the mineral life so plant life grows upon it. As soon as it has built up definite forms in the plant, as soon as the nitrogen that is in the soil, the potash that is in the soil, the phosphoric acid that is in the soil, have all worked together, combined with the oxygen found in the air and in the soil, it has worked up into a fully organized structure that exists in the three, in the leaf or in the cornstalk.

Then along comes the animal and feeds, not extensively upon the mineral matter that is in the soil because its structure is so highly organized that it cannot utilize to any great extent the mineral matter in the soil, but it feeds on this second structure, to wit, plants and vegetables.

We have found in all the elements that go to make up this world, scientists tell us they have been able to identify somewhere about eighty. Among those elements are carbon, hydrogen, nitrogen, oxygen, sulphur, iron, calcium, magnesia, sodium, aluminum, and several others that go to make up the chemistry of living matter. There is nothing new that is going to form itself upon the planet, there are no new elements, no new substances are going to be created. We have our nucleus of life right here. Animal life depends upon the vegetable life, and vegetable life depends upon the mineral life.

The first foot or two of the small cells of the earth is the working field for the vegetable and animal life. It goes without saying that if you transfer those mineral matters into gaseous materials by reason of which they cannot be concentrated and put on the soil, then the mineral elements that exist in that foot or two are forever lost to animal life. For instance, if we drive out the nitrogen, that chemical

that exists in the surface soil and in the first foot or two of the soil of the earth, if we drive that out in a gassy form and if we are not able to bring it back in mineral form again, we have been gradually contributing to a loss of nitrogen, which must gradually bring about the stopping of all vegetable and animal growth because it is essential to have this nitrogen for the growing plant, for the growing of life. This nitrogen is inert but when we put it in the soil it is the most valuable fertilizer or stimulant for plant growth that we have. When we put it into the animal body in the form of lean meat, or white of the egg, or those substances which we call protein, it is the most valuable substance with which we have to deal because our existence depends upon it. If you shut protein out of the dairy diet, a cow cannot exist. You can feed a dairy cow on straw successfully but you cannot take granulated sugar and feed an animal on that indefinitely, because there is no nitrogen there and you cannot feed an animal on starch, but you could feed an animal on meat or eggs indefinitely if they did not die from lack of variety, because meat and eggs have nitrogen and all the other elements that are vital to life.

It is essential that a systematic system of husbandry be practiced so as to secure this element of nitrogen that is present in the air and return it to the soil, which may be done by the growing of leguminous crops, such as clover, peas, cow peas, beans, etc., that have little bacteria that grow upon the roots and convert this nitrogen in the air back into the mineral nitrogen in the soil. There are other elements that are essential as well as nitrogen. It is essential that we should have carbon, it is essential that we have oxygen, and there must be some means of getting those things out of the atmosphere into the soil in order to keep up a constant growth of material with which to nourish animal life. There are also other elements, such as calcium and potash, and all those things that are being constantly removed from the surface soil and if there are no means taken of returning them to the surface soil eventually there is exhaustion of material there.

If we should take the land in this section of the country, which possibly some years ago when it was first cultivated produced forty bushels to the acre of wheat, and this I think through here is not an extensive wheat section, at any rate probably it produced forty bushels of wheat to the acre the first year, the second year the land could only produce thirty-five bushels, the next year thirty bushels, and we cannot now produce thirteen bushels to the acre, possibly we can produce eleven or twelve bushels of wheat to the acre. The average crop of wheat per bushel to the acre in this country, I think, is not over eleven or twelve bushels to the acre where it was up to forty and sixty bushels to the acre, because there has not been a systematic method of husbandry made use of in order to bring back those materials that have been, by constant cropping, gradually eliminated from the soil.

Without going any further into that phase of the matter, if I might just briefly discuss what happens gradually in the rule of Nature to all of these various compounds. First we will start with the mineral. They are converted by gradual chemical changes into soluble materials in the soil and taken by the plants in the form of starch and sugar, such as the gluten in wheat, corn sugar in the corn and sugar in the

sugar beet. These products are taken in the form of sugar, in the form of starch, in the form of gluten by the animal and by means of a system of digestion in the animal body are converted into blood and there is continual repair due to the action of the food material that is furnished through vegetable life that goes into the animal and continues to make growth of the animal during its period of life. Now when the life of the animal has reached its zenith decay sets in and this decay is brought about by the action of bacteria, and they bring about to a great extent the solution of the mineral matter or life bearing elements which originally started life, so the protein in the meat, the flesh of the animal and the sugar forming materials that exist in the animal body are by a process of bacterial decomposition economically reduced when the life history of the animal is completed, so that they may again be utilized.

This, in brief, is a rough sketch of the life of the elements as they circulate in this planet and in all planets, because all planets are subject to the same law that this planet is, viz. the law of gravitation.

We have heard quite a good deal in the last few years with relation to the possibility of life on some of the other planets. It is not at all impossible, from a scientific standpoint, that there should be life existing somewhere on other planets which bear similar arrangements to the solar system that this planet bears, but what forms these lives take we have absolutely no grounds to argue from. The only ground that we have which leads us to think it may be similar to our own life is that under this system of gravitation, which is the same system that other planets possess, on this planet there is definite form, consequently we assume that under the same law of gravitation it may take the same form on other planets, but the highest type of life which may exist in Mars, for example, may be entirely different from the highest type of life that exists on the earth, simply because the power of gravitation that exists on Mars may be stronger or not so strong as it exists on this planet and it may develop life in an entirely different direction.

The theory of evolution with which this matter is concerned, the so-called Darwin theory, which has done so much to encourage the study of the life history of our planet and of the life manifestations that exist on our planet, would account for all forms of life both animal and vegetable that do now exist. It is not at all to be supposed that the only thing with which the Darwin theory is connected is the origin of man from the lower animals, particularly the monkey. We have heard it spoken of many times that the monkey is the ancestor of man. Whether there is any truth in this really does not matter. As for myself, I would, like Darwin, as soon be descended from an animal that would descend, as Darwin's monkey did, from the top of the mountain to rescue its offspring from a group of hungry dogs, as I would from the savage that practices infanticide without remorse and lives as he lives. I see nothing objectionable in that theory, but there is a good deal of truth and probability in it. If the theory of evolution is correct, man, due to a course of environment and exercise of will, has risen from the lowly conditions to the condition he now occupies, but it may be by a gradual transformation. We know that if we study heredity of animals that there comes a time in the life history of an animal when there

is suddenly a strain in one direction. This is illustrated in our modern breeds. They are developed from selection and those different exceptional individuals are possibly not the result always of definite distinct careful lines of breeding, but are selected as a sport that Nature has thrown out and they seem to possess some decided changes. We know in the vegetable life that occasionally in studying any particular plant, it would seemingly disregard all the natural laws and would jump out to one side and develop into some definite plant life entirely distinct from that which was the immediate ancestry of that particular form of life. It is possible that when we have reached a certain plane of evolution that some jump may have been made, by means of which brought into favorable environment and circumstances, it has finally developed into a higher form of life, which we know as man.

Be that as it may, no matter from what form of life that is now existing in man was formed, whether it came from the lower animals or whether it came suddenly as a development of some prior moving impulse of the Spirit that moves it and moves all those different lines of life that exist on this planet and other planets, it is just as binding and just as powerful as if it was formed in some other way.

To bring you back for a moment to the general thought,—by the action of heat and cold, etc., mineral matter is at first converted into form by which it may be taken up by the vegetable matter; the vegetable matter takes these up in plant form from the nitrogen of the air and carbon of the air, through forms of products known as sugar, starch, protein, etc. The animal life, existing and living by means of this vegetable life, together with mineral life, are present in the form of more complex compounds upon which man lives. After the life history of the animal is passed decay sets in, the same forms or similar forms of bacteria works upon this organized matter, destroying it and liberating its elements again, which enter into the soil, and we have the circulation complete.

I have gone at this matter in a rambling sort of way tonight. It is not at all the way I planned to present it to you and there are a good many thoughts I have not given in a systematic way, but it is so late that I shall not attempt to go any further into this subject.

The Chairman: That completes the program for this evening. If there is nothing further to come before this meeting, we will now stand adjourned until 10 o'clock tomorrow morning.

## TUESDAY MORNING SESSION.

Meeting called to order at 10:30 o'clock and opened with a song "America" by the audience.

## BENEFITS OF THE SILO.

MR. COLON C. LILLIE, COOPERSVILLE.

The Chairman: As Mr. Butz is not to be here, I shall have to start this subject on the "Benefits of the Silo." As we are a little late in getting started, I shall not go into the details of making and shall leave a greater part of the subject for discussion to follow.

Of course the principal question to be asked is "Why do we want ensilage? What is the use of getting a silo? Why do we preserve the corn in this way? Is it any better, is it profitable to do so?" I think the principal reason that can be given for the preservation of corn in the silo is that we want a succulent food to feed, because practical feeders have learned long ago that we can get better results in feeding animals if we have some succulent feed in the ration than we can if we have all dry feeds. The Englishman has to have his roots and the Canadian farmer does not think he can furnish animals for the block without a succulent feed. It is not so much the food value of the roots or the ensilage but it is the effect that that succulency has upon the animal economy. You can just imagine in what condition we would be if we were deprived of all kinds of succulence or fruit in our rations. People live better, feel better and are healthier to-day largely because we have a greater variety in our diet, more fruit, more succulence in the diet, and it is the same way with animals. I think that is the best reason that ought to be given for corn silage, is that we want a succulent food in the ration and we can preserve the corn in the silo and maintain its succulency.

There are a great many other reasons. We know that we do not add anything to the food value of the corn plant when we put it into the silo, the chemists tell us there is a loss. Cut the corn plant when it is just mature and put it into the silo and there will be a slight loss because it heats up and ferments and causes a deterioration in the food value. If we have a good silo, however, and put the corn in at the proper stage of maturity, we can preserve it in there and have a loss not to exceed five per cent of the food value of the corn crop. That has been demonstrated carefully at experiment stations. Wisconsin has made careful experiments along that line and if we have an air tight silo and put the corn plant in there we can do it with the assurance that there will be no loss to exceed five per cent of the face value of the corn plant. We have always been told there was a loss in putting corn into the silo and



people have hesitated about building silos because of this, they say "I do not want to build a silo because there is a loss there." They do not realize there is a greater loss in dry curing the corn plant than preserving it in the silo. As a matter of fact, the loss in food value caused by dry fermentation (it is fermenting just the same only under different conditions) is greater in the dry curing of the plant than it is in putting it into the silo. This has been demonstrated at the Wisconsin station too.

The corn plant differs from other forage plants from the fact that the stalk is large and contains so much sap that we cannot dry cure it so we can store it with as little loss as we can dry cure timothy hay or any plant with a smaller stem that we can dry the moisture out of. If you cure in good weather, you can dry clover hay so you get only eight or nine per cent moisture in it and in that condition you can put it into a barn so it does not ferment and it will preserve almost indefinitely, and yet you know clover hay if it is held over is not as good as the first year. A little fermentation takes place then on account of the moisture that you did not get out, but it is almost impossible to dry this out of the corn plant. You have to leave it a long time in the field in the weather and then in storing it away you cannot store it in the same way you do hay, it has to be put on lofts or in stacks and then much of it moulds, but not taking that into consideration, just take the loss from the fermentation of the plant, even if left in big shocks or shocked under cover if you want to, and yet there is oxidization going on the stalk of that plant owing to the excessive amount of moisture in it compared with other plants, so in six months time there is a loss in the food value of the corn stalk of 25 per cent. Let me make that plain. We have the corn plant standing here in September just matured, the kernels are nicely dented, perhaps not quite mature enough if you were going to shock it but the kernels would shrink a little, but you could have it moist enough so it would not shrink. You cut that corn and put it into a good air tight silo and you can preserve all the food value that it contains then, and it then contains the largest per cent of digestible nutrients it ever does, within five per cent; but if you shock it, husk it and crib it, bind all the corn stalks and put them into the barn, in six months time you will have lost 25 per cent of the food value of that fodder in the dry way, while in the silo you will have only lost five per cent.

In the early stages of the discussion of the silo in this country that point was made prominent and farmers would say "Well, Dr. Kedzie says fermentation of the ensilage in the silo causes a loss in food value. What do we want to build a silo for?" But Dr. Kedzie did not investigate this other and make it prominent and compare it when the matter was discussed. There is a larger loss in the dry curing even under the most favorable conditions than there is in preserving it in the silo, so that under the most favorable conditions we can save at least 20 per cent of the food value of the corn plant by putting it into the silo and we have a succulent food.

Again, it is more economical to store the corn plant in the silo than in the dry way because it takes less room to store the crop. It is not necessary to have a very large silo to store a good field of corn, but it is

necessary to have a lot of loft room in the barn to store those corn stalks dry.

The loss in fermentation, however, is not the only loss that you get from dry curing over and above the silo. When I was a boy and went to the district school, it was my business in the winter time after breakfast to climb up on the corn stalk stack, throw off a bunch of stalks for each critter, turn out the animals in the yard and feed them on those corn stalks. They would eat the top of the corn stalks, most of the leaves, some of the best part of the husks, sometimes they would eat the stalks clear down to the ear, but it was rare indeed that an animal would eat any portion of the corn stalk below the ear, and every day there was a layer of corn stalks scattered over the yard, and in the Spring they were a foot deep over the yard, and that was absolute waste. We did not get any food value out of it at all. If that same crop of corn had been put into a good silo there would not have been a bushel basket full of waste. Is it any wonder when a farmer builds a silo on his farm and puts his corn crop there, that he can see at once he has increased his capacity to keep stock on a farm.

This corn plant that we are talking about, suppose we represent its food value by 100. Sixty per cent of that food value is in the ear, and the ear does not deteriorate very much in dry curing because there is no dry fermentation going on. That can be preserved in the grain, but 40 per cent of the food value is in the stalk, and that is worth saving in this country. In Illinois and in some parts of Indiana in the better portion of the corn belt, the land is so rich and farmers are so rich that they can afford to throw away 40 per cent of that corn crop, but in Michigan we cannot afford to do that. Of this 40 per cent of the food value of the corn plant, 75 per cent of it is in that portion of the stalk which is below the ear. You see, when you think about it, that there is not much weight in leaves of the corn plant; the whole weight is in the butt of the corn stalk, that part below the ear. I say 75 per cent of the food value of the entire forage of the corn plant is below the ear; 75 per cent of 40 per cent is 30 per cent. Thirty per cent of the food value of the corn stalk is in that part those cattle did not eat and would not have done them any good if they had eaten it because in this dry fermentation the starch and sugar have been gradually changed until that has become woody fiber and indigestible, and we might as well feed horses oats made out of shoe pegs as to feed cows butts of corn stalks and expect to get any results from them. That is the reason why we gain when we put the corn crop in the silo.

Take into consideration that loss and the loss from exposure to the weather in the Fall and I do not believe that in the dry curing any man gets more than 50 per cent, and many not that in food value of the fodder itself of the corn plant, with the exception of the ear. The ear does not deteriorate so much in dry curing in proportion as the fodder part of the plant does itself.

These are the principal reasons why we want to put the corn plant into the silo. We can harvest the corn crop and put it into the silo cheaper than the old way; it takes less room to store it and we can preserve it indefinitely. The time is coming when every dairyman will have ensilage enough so he can supplement his pastures in the summer time

with ensilage. Every man who has given it a trial realizes that it is a good deal less expensive to soil with corn silage than to attempt to raise soiling crops. Of course there are a great many men who believe in soiling in the summer time and there is something in it if you have the pasture, but if you compare soiling with summer silo the latter will win every time. There is no argument that will stand against it.

At one time I was very enthusiastic about this question of soiling in the summer time. It takes a lot of pasture if you have a big herd of cows. We have something like forty acres of permanent pasture, land that is rough and cannot very well be plowed up, but with a herd of fifty cows forty acres of pasture does not last very long. We have to supplement it. We do not pretend to leave our cows out doors one single night in the year, they are kept in the barn every night in the summer. One reason is that they cannot get their full ration from the pasture and we have to feed them something in the barn anyway, and then it is a job to put fifty cows in the barn. We have to figure on those things because we have to hire it all done so we put them in the barn every night. They can eat all the pasture furnished in the day time besides eating a ration at night. With this pasture and this soiling, I became very enthusiastic about soiling. You can put in Fall rye and that grows quickly in the Spring, and you can have it for this soiling crop. Red clover comes early so you can cut that. You can sow peas and oats two or three times so as to have them in succession. Then the theory is when you take off this rye you can plow the ground at once and put in some other crop, perhaps early sweet corn, and you can have a succession of soiling crops that will furnish you green succulent feed perhaps the entire summer for your cows. The theory is all right but it does not work out all right in practice. That is my experience. I tried this thoroughly two years. The first year was a dry year and the succession of crops would not come along because there was not moisture enough for the fermentation of the seed and starting of the plant. I cut off the rye and planted the corn to have a crop later on but by plowing up that ground the moisture was not all in and the corn did not grow. If I could have had rain at the right time it would have had a nice start, but it did not rain. I tried it the next year. The next year was just the same, it was too wet. We had to run the machine out there in the mud, sometimes it was stuck in the soft ground almost as deep as the ground was plowed. We had the hay loaded up there to gather this after it was cut with the mowing machine, and that would get stuck in the mud. We had to get in there because the cows were waiting for the succulent food. Then we would have to go out Sunday morning because we would not have enough to last over Sunday, and I got tired of soiling and quit it entirely. The summer silo takes the place of these soiling crops. You fill your silo in the fall with mature corn. You never get this succession of crops so you are feeding those plants when they are at their best, you feed some too green and some you have to hold until they become too ripe to hold until your next crop comes. You never feed them all at their best, but with the summer silo you can fill that when the crop is just properly matured and it is sealed and left until the next summer, and you will then be able to feed mature corn silage. You are getting all the food value out of that crop you

can and you are doing it in a business way. See how much it costs every day to cut enough green stuff for the cows and haul it in. Labor is so expensive I do not believe soiling is practical in this country. With a summer silo you have a succulent feed; the cows seem to like it and do as well as they do on the green corn taken in. I do not know but they might relish a little green corn once in a while in preference to corn silage but they do well on corn silage and you can see the advantage of a summer silo and having ensilage to supplement pasture in preference to soiling crops.

The corn crop is mature, you have a gang of men that can work a full day; you can get more out of your labor than where you have to send out a gang of men every morning or every other morning to cut forage crops and haul them into the barn. You cannot economize your labor that way, and in the fall when your corn is mature to have a gang of men to store this crop and keep it until the next year.

I do not know whether this subject was to discuss what kind of silo a farmer should have. I do not think that is necessary to discuss unless someone wants to ask a question in regard to it. The thing to do is to get a silo. Now then there are different kinds of silos, there are silos made of different material and they are all good, providing they are air tight. They must be air tight receptacles. The nicest way to get a silo is to buy one of those manufactured stave silos. Give your order for it and you will get it, and you will pay for it. It will not take more than a day or two to put it up and you will have your silo. If you want a cement silo, there is a lot of bother about it. You have to haul the gravel, get someone to mix it and put it up, and it takes a lot of labor. You can build a lathe and plaster silo, and they are good silos. I do not know just what the cost of these different silos would be but I do know that you can get a manufactured silo with the least bother, paying for it of course is a different question. You will have to pay for the other silos. In the other silos you put in a lot of your own labor, you ought to have pay for that labor and it ought to be figured in the cost of the silo, but, as I said before, use your own judgment, select the silo you think will give you the best service for the money and if you have no silo be sure and start and have one before you get your corn crop this year.

One man criticised it and said "I did not put all my corn into the silo." That is nothing against the silo. We have to have corn as a grain. We have to have work horses on the farm and there is nothing better for a part of their grain ration than corn, it is hard to get anything to take its place. I cannot put it into the silo, husk it and have it for the horses too, so I would like to have about three thousand baskets full of corn every year to husk besides filling the silo. That would nicely cover my needs. I hardly ever have that and have to buy a lot of ear corn to get me through, because we have work horses, hogs and hens to feed the year round. That is why we do not put it all in the silo because we want this grain. Then again, it is nice to have some corn and shred the corn stalks because it gives us bedding. That is quite a serious proposition with a farmer who has a bunch of cows and raises young calves in the barn. He has to keep them dry and clean and it takes bedding to do it. If you do not raise a lot of grain it is a nice thing to have some extra corn stalks to shred because while a lot of

them are good for nothing for feed they do make first class bedding; they will absorb a lot of liquid manure and I believe are better than straw for bedding. That is the reason why a man wants to raise more corn than is just necessary to fill the silo.

There are a number of reasons that can be given for a silo but I think it would not be profitable for me to spend any more time on the subject. I would like to hear others express their opinions upon the subject and would be glad to have any questions asked. Are there any questions? Mr. Hull is here. He is a great believer in corn silage and it would be a nice thing to get his opinion about this because every man looks at a question from a little different angle, and you get some information put in a different light.

I am glad to know that there are a number of silos in this community. Coming up from Mr. Fuller's this morning we saw a number of them. It speaks well for the dairy interests here. When you see a man with a good big silo you are pretty safe in putting that man down as a good dairyman and when you have a good dairyman you have a good thrifty man with an income he can depend upon and a good citizen, so a silo is indicative of a good man.

#### DISCUSSION.

Mr. Myers: Can you feed enough ensilage so as to injure the milk in any way for making butter?

The Chairman: I think you can. The corn plant when in its green stage has a rank flavor and if you feed too much at a time before the cow becomes accustomed to it, I think that would taint the milk. You can do that even if you do not put the corn into the silo. I know a man who pretty nearly ruined his trade. He made butter and delivered it to private customers in the city and nearly ruined his trade by feeding green sweet corn, throwing it into the pasture, but you can feed green sweet corn and not have it affect the butter if you feed it right. In this instance I refer to, the summer was extremely dry, the pasture dried early, and this man had an idea the cows ought to have more bulky feed than they were getting out of that pasture but his corn was not mature enough to feed it, so he held off as long as possible and finally he had to cut it even before he ought to. The cows had had no green feed in so long that they were greedy for it and ate too much of this corn so that it threw their system out of normal condition, tainted the milk, and the taint was easily detected in the butter. His customers all objected to it. If the same thing had happened through feeding ensilage, they would have said the silo was no good.

Ensilage is a green, rank, bulky, unbalanced feed. That is not a very good argument but that is the truth. You do not want to depend upon ensilage as your bulky feed for cows, you will not get good results from it. You ought to have dry forage with it. In summer you do not need feed with it, but in winter you want hay and grain richer in protein than the ensilage in order to get an economical ration for your cattle. When you first begin to feed ensilage in the fall, it is not advisable to give a cow a full ration at first. If a changed feed at any time, no matter what that was, I would not give a cow a full ration of this feed. Work it in gradually, commencing with a smaller amount

and when you do that there is no trouble about ensilage tainting the milk. Before we had a hand separator on the farm and delivered our own milk down town, there was a lot of people down there that wanted our milk. We had a nice old fellow that was drawing the milk down there and liked to accomodate everybody. He supplied ten or fifteen families with milk from our farm and they never detected taint from ensilage in this milk, they thought it was good milk and it was good milk, and those cows were always fed ensilage. The same thing comes about feeding bad odors. At a Farmer's Institute three years ago a farmer asked if he could feed beet tops. I said certainly, that we fed beet tops very freely. He said "I fed beet tops and the milk man refused to buy my milk. When we got the beets harvested we opened the bars and let the cows into the field and they ate all the tops they wanted." The cows ate too much. It was not the beet tops, it was the man. When we begin to feed beet tops in the fall to the cows we only give them for the first feed a small amount, the next feed we give a little more, but we do not take their other ration away from them. If you are feeding hay keep that up and give them their grain; put in this feed the beet tops and gradually increase the amount, and finally a cow will get so she can eat a bushel of beet tops night and morning and it will not taint the milk. I believe if a man were careful enough he could get a cow to eat onions so they would not taint the milk. You know some people cannot feed turnips, and yet there was an old dairy farmer in Wisconsin that raised hundreds and hundreds of bushels of turnips to feed his cows and he never had any trouble about turnips tainting the milk. You can feed cabbage to cows if you only use good common sense in feeding, and that is all there is about it.

There is a difference in the quality of ensilage. We could spend this whole forenoon on ensilage and not tell all about it. If you put your corn in very green it does not keep as well and does not make as good ensilage, it has a stronger odor and when you feed it you have to be more careful or it will taint the milk more than mature corn silage. This other question comes up. It is said that the Borden Milk people refuse to buy milk of a dairyman who feeds ensilage, and they have driven the silo out of some of the best dairy sections of this country but it all came about because some farmer did not know what he was doing; he had poor silage, did not feed carefully, and it tainted his milk and that tainted all the milk at the condensary, so they had to shut down on ensilage, not because ensilage could not be fed but because once in a while one of their patrons did not know enough to feed ensilage properly. There are other condensaries, the one that Brother Hull patronizes for instance, and there has never been any trouble about the feeding of ensilage.

Mr. Hull: The Crescent Company, which took first prize at St. Louis, advise their patrons to feed ensilage.

The Chairman: Are there any other questions?

Member: Does it make any difference whether ensilage is fed before or after milking?

The Chairman: I think it does. To be safe about that, it is better to feed after you milk. All ensilage has an odor. When cows are being fed ensilage and you go into the barn you can tell it at once. Milk is prone to absorb odors and if you are milking in a stable that is full

of this odor of ensilage, the milk is liable to absorb some of it. It does not come from the cow's udder in that case; it is because the odor of ensilage is in the air when you are milking and the milk absorbs some of the same odors of the ensilage. However, some experiments have been made along that line that would go to show there was no danger in that. I heard Professor Clinton D. Smith, of the Agricultural College, say that they took the cans of milk out and put them in the silo and tried to get a flavor in the milk but it would not get in. I believe, however, it is safer to feed ensilage after you milk rather than before.

If there are no other questions, we will hurry on, and if you have any other questions regarding the silo, you may put them in the question box this afternoon.

The next topic on the program this morning is "The proper relation of one Creamery to Another," by Mr. E. K. Smith, of Hart.

## THE PROPER RELATION OF ONE CREAMERY TO ANOTHER.

MR. E. K. SMITH, HART.

Mr. Chairman, Ladies and Gentlemen:

Before I take up this subject there is another point I wish to make. You all know we cannot run a meeting without money. There was a resolution passed at the State Dairymen's meeting that all auxiliary associations in this state could, by collecting a dollar from each member, make those members members of the county association and the state association as well. The county pays out of this \$1.00, sixty cents to the state association for your membership and the 40 cents is retained in the county for running expenses of the county association, and each member receives a large report published by the state association, giving you the proceedings of the state meeting and all the auxiliary meetings held in the state during the year. That book is worth many times the cost of membership. I will ask Mr. Myers, our secretary, and Mr. Fuller to wait on you and collect your dollar. We need some money and I hope you will all be liberal because you will receive this volume and you will be well paid.

Taking up this subject of the proper relation of one creamery to another, it seems to me this is a matter of vast importance. I believe we do not consider it in this state as seriously as we should and I believe the time to consider this question is right now. I think we should not neglect this subject of coming closer together, one creamery with the other, any longer but go hand in hand in this work.

We find in studying this creamery situation very carefully it is not all traveling on flowery beds of ease, by any means. I think some of us have experienced that to a great extent and we find that just the minute a farmer's pocketbook is touched he is somewhat angry and dissatisfied. Some few weeks ago on the train I met a farmer, who had been one of my whole milk patrons, but he got so angry at the creamery that he made an investment, which he thought a first class investment, he bought an economy separator and he decided to send his cream to

another creamery, a creamery that was moving somewhat pleasanter and traveling a little more on flowery beds of ease. He said "I cannot do it, I lost over \$8.00 in one month and I cannot afford that." If we were closer united, if our relations one to another were more uniform in a case like that, if there are any ups and downs, if we all get together with the patrons of that community and explain the situation to them, I really do believe that things would move a great deal more smoothly in some sections than they have in the past. It would show we were working on one general plan, and even at its best the manufacturer of butter is not going to become a millionaire during the year 1909. Do not think for one moment he is going to ride around in \$3,500 automobiles, because the profits are entirely too close; he is working entirely on too close a margin, and when he is not getting the dollars and cents, when he is not getting the returns from his butter on the markets. There are many things to be taken into consideration more than the manufacture, and we should hesitate before we say those men are taking the money away from the farmers and putting it into their own pockets.

It was said last night that it all came back to the farmer, if there is a reduction in price it falls on the farmer, he is the man that suffers the loss. He does to a great extent and probably it is right that he should stand some of these losses and it would not be right if he did not stand some of the losses. For instance, take the markets as they have been this winter. Quotations have been exceedingly high for that much desired, natural flavored butter, and a manufacturer with that kind of butter had no difficulty in commanding a good price and an easy sale; but if the butter was old, stale flavor it would not bring a good price, and when each creamery is working individually as we have been in the past, if a patron comes to a creamery with a can of old, stale cream, which he has been five or six days collecting, and sometimes longer than that, what can the creamery manager do? I came to my plant on the first day of February. I had one patron drive up to the door with three five gallon cans of cream, collected from seven cows, testing 38 per cent, which improved the quality in his estimation. I gave that man a severe talking to, and the answer I got was "If you do not want it the other fellow will take the stuff," and I let it go. The other fellow got it. This patron finally came back with some cream that was a little better but it is not yet what it should be. If one creamery refuses it, the next creamery should do the same, but we have a place in the state of Michigan into which we can dump all our old stale cream, and they turn out first class butter from it. How this is done I am not able to say.

Another thing, if each creamery would have its own territory, keep within its own bounds and try to produce more milk at less cost in that territory, it would be more advantageous than spending money traveling out enlarging that territory and number of patrons. A creamery manager by following that plan would do a great deal more for the benefit of his patrons and for the improvement of his product and realize more dollars and cents than to try to establish a cream route in a territory rightfully belonging to another creamery, paying a large sum of money to haul the raw material in and only get a small amount of



butterfat, perhaps going over the route once a week as is done in some cases.

These are the things that are working to the detriment of this business, they are the things that are making us all suffer. This morning coming down to this meeting, in conversation with a man, I made this assertion, that in Oceana county, where there are five creameries operating today, the best thing that could be organized would be a creamery man's association. If we establish such an organization many of the farmers may say we are forming a trust, but it would not be a trust, it would be an organization where creamery buttermakers and managers could get together once a month and discuss these problems, discuss how to arrange these meetings without conflicting with one another. If you go into many territories you will find six or eight patrons on road, on another road five or six, with two teams going over each road, where there should only be one. Instead of going out to the patrons and saying "This other creamery is robbing you, your test is not giving you an honest price," tell them the same story that we are all trying to do the best we can. Then if anything confronts the creamery, if they are having trouble with their product, let the different creamery men get together, meet the patrons of that creamery and discuss this matter, and let the patrons see that it is not all traveling on flowery beds of ease.

I hope these suggestions will sink into the minds of all of you. Take it home with you and digest it thoroughly and I do hope that the time will come when we will have an organization of this kind not alone in Oceana county but in every county in this state, and that we will get these matters on a satisfactory plane. It will be money in the pockets of the producer as well as the farmer.

The Chairman: Mr. Hull is to lead in the discussion of this subject.

## DISCUSSION.

MR. N. P. HULL, DIAMONDALE.

Mr. President, Ladies and Gentlemen:

There is not very much left for me to say in regard to this. Certainly a man who has been in the business as Mr. Smith has understands all the ins and outs of it, has run up against those other creameries and knows where the difficulty has come because the two creameries did not have a thorough understanding and cooperate as they should, is better equipped to talk about a proposition of this kind than I am, who never operated a creamery.

Of course going around as a member of the State Dairy and Food Department, I have seen where three or four or five men who were operating creameries could have gotten together and had a fair understanding and they would have all been much better off. Certainly it requires time and money to send two teams over the same road where one team could take all the cream and bring it in. This idea of en-

croaching on another man's territory is wrong; if there could be lines drawn and each man stay in his own respective territory, the two creameries could handle their product more cheaply than if they cut into each other's territory. Of course we are all inclined to have our day off and think the other fellow is beating us. I do not know what sort of cooperation we are going to have that will enable all men to see alike. It is not natural. I think more of my wife, I hope, than other men do and we are all given to doing that. Certainly a man will like the ways of his buttermaker over there and because he feels friendly towards him he feels disposed to be satisfied with that man's test and with the price he gives him for cream, while he would not be satisfied with the other man because of the peculiarities of their disposition that do not get along as well together, so I do not know that we should draw this line too closely; and if we should draw a line through here and say "All on this side of the line must go to one creamery and all on the other side of the line must go to the other," the farmers would be sure to say "They have fixed up a job on us" and the American people are apt to object to that sort of thing, so I can see there are some difficulties about working out this plan of cooperation in not encroaching upon one another's territory.

There is one point I find that M. Smith did not touch upon. If a farmer over here is dissatisfied with the test given by the creamery where he is taking his milk and he takes another sample over to a creamery a little farther away, he is cocksure to tell that man "I do not believe I got the right test and I thought I would bring my sample to you and if you give the right test I will bring my cream here," it is a little too much to expect that that buttermaker will not give this fellow a full test anyway, and if you do that thing you are going to have some dissatisfied patrons that are going over to the other fellow and tell him the same story, and you cannot blame the other fellow if his test should spring up a little in that man's case, so we are not a little better off in playing a sharp game. It is a knife that cuts backwards. There is a place where the buttermakers could cooperate that certainly would be to the benefit of their patrons and to the benefit of the industry all over Michigan because you cannot do any more to encourage a man's faith in the test. He may take half his milk to one buttermaker and the other half to another buttermaker, and if he gets a higher test from one man than another is he not warranted in his criticism?

Then there is this other one of refusing bad cream. That is something that all buttermakers ought to cooperate on. If you cooperate in drawing your lines and just taking what is on your side of the line, refusing what is on the other side, it is going to work to the dissatisfaction of the patrons, but if you co-operate and say to the man that is bringing bad cream "We will not pay you a full price for that cream," and if this man goes to the next buttermaker and he says "I cannot pay you a full price for that cream," you are doing your patrons some good and you are doing the industry in Michigan good too; but the man that wants to get the other fellow's patronage so badly that he will say "I can handle that cream all right" is injuring the whole industry, although that is one thing about the farmer, when he goes to the other fellow he will take better care of his cream for a while just to show

the buttermaker that it is good enough anyway, and if the local butter-makers all over the state of Michigan would cooperate as well as they could along that line they would refuse this bad cream, the cream that has stood for a week or even stood for one day in a cellar where it may be tainted, or stood in the kitchen where the good wife bakes and washes, fries, the pancakes, and the cream comes down with a little fried cake, a little odor of cooking, and all that sort of thing if it could be turned down by one man and turned down by the other man, or accepted at a lower price, it would help the industry in Michigan.

I can see where conscientious buttermakers would have a little difficulty. There are some knotty things about that proposition too. Here are three buttermakers. Suppose they intend to do the right thing. Here is cream from one man, the cream is bad and they all turn it down; here comes some that is bad and some that is not quite as bad as that. Where are they going to draw the line to be sure they are right? If it is just right to the line what are they going to do? Are they going to say it is on this side or that? They may be conscientious and the farmer take his cream to the other fellow, who has just received a bad lot of cream that day, and this looks pretty good to him in comparison, so he takes it. It is not something that we can measure, make a rule down by the side and see whether it comes up to the measurement or not, because I do not believe there is any man living that can judge cream and feel exactly the same one day with another towards a bad batch of cream. For instance, I have inspected a lot of milk and cream that comes into factories and if there happens to be a bad batch (we found a drowned rat in one lot and a mouse in another) and then we come to some that is pretty bad but it may not be so bad and it looks a good deal better to us that day than if that batch of cream had come in with a lot of better cream; and so to draw a line and say where we can stop and not take that and yet take the other is a hard proposition, but we can do better than we have been doing, because the disposition of buttermakers has been if a man has been sending his cream over here and the buttermaker would not take it he would take it over to the other buttermaker, who wanting his patronage would say "I can handle it" although he knew he was doing the thing that was encouraging the farmer to go on with his careless methods of producing poor cream, and this has been encouraged in Michigan until there are altogether too many bringing poor cream and then we talk about it; but here is the proposition that we have to come to, that is that the farmer who makes that poor cream and brings it to the creamery has to understand it is worth less money and he has to take less money for it. How many men are producing cream in Michigan will come to a meeting and say "If the quality of Michigan butter goes down we will take less money for it, but I can improve the quality of Michigan butter by taking better care of my cream than I have? I am an important factor in the proposition, there is no use in my denying it" and if at the creamery he has to take less money for poor cream then he appreciates the responsibility of Andrew Johnson right there as far as his pocket book is concerned, and we have to come to that in Michigan before we get good cream.

The Chairman: This subject is open for general discussion. Has

anyone anything to say in regard to the matter. There are a lot of farmers and dairymen here and some creamerymen.

I thoroughly believe that we ought to have creamery associations, business organizations among creameries in different sections which, according to their location, would naturally come into a business organization. I do not believe that these organizations ought to be for the purpose of trying to make more money out of the farmers, I do not think they could do that were they to attempt it, but they should be for purely business purposes. Very much could be done, as has been suggested here, in reducing the cost of delivering milk and cream if there was only a business organization among the farmers of a certain community. Then there are subjects that ought to be talked over by the butter makers that are not discussed as much as they should. One buttermaker is having better success than another and his plans ought to be talked over, as we dairymen talk over our plans about feeding, etc., and in this way we get information that we cannot get in any other way. Everybody looks at these problems from a different angle; when they are presented from all the different angles we understand them more fully than we did before. We ought to have an organization, every dairy community ought to have an organization of dairymen. They ought to meet often to discuss practical problems. There is no question about that. There is much to learn and much that can be done for our improvement. Our cow testing association down at Coopersville this year adopted the plan of meeting at one of the member's farms each month. The March meeting is to be held the last day of this month at Mr. Hawley's at Berlin. We are going to have a little something to eat, that is necessary of course; then we are going to have a short literary program, I helped make that up, and of course in the first place we are going there and are going to have time to look over Mr. Hawley's herd, see his way of doing business and find if we cannot learn something from what he is doing; then we are going to discuss the problem, for instance, "Will it pay to feed grain and pasture, or will it pay to have a summer silo?" We are going to have that talked over and one or two other subjects that will be practical and something we are going to think about in the near future on our farms. You cannot make me believe but every man who will go to that meeting and take part in it will be benefited; he will look at those things in a different light than he did before. We do not know everything, we can all learn and the more information we get the better it is. It is the same way with the creamery men. The average creamery men need to get together and talk over things with their neighboring creamery men the same as the farmers do.

This idea of having an organization of creameries here that would beat the farmers; if they beat the farmers the farmers are foolish to let them, that is all. Nobody can beat the farmer if he is up to date and knows what he is doing. Farmers ought to have business organizations and creamery men ought to have business organizations, and the farmers can know whether a creamery is beating them or not. I think it is unbecoming a dairyman to go out and say a creamery is beating him when he does not know whether it is or not. Such a man is not a first class citizen. A man can weigh his cream, weigh his milk and keep track of it, and why does he not do it? So far as the price is concerned,

the price of dairy products is quoted in the daily papers and the farmer knows what the price of dairy products is and knows whether the creamery is paying what it can afford to or not. The farmer will not get beat unless he is to blame for it himself. We ought to have these organizations.

Another thing, sometime we are going to have creamery organizations for the purpose of selling our products and getting a better price for them. We are not going to ship our butter to a commission man away down in Philadelphia or New York and know nothing about what class of customers it goes to or how much he is making on it. The creameries of a county or of a district or something of that sort will have a business organization so as to have a selling agent in New York or Philadelphia to handle their product. Then they will have to agree to have a certain quality of butter. We have to have organization to get that and when we do we can get one to two cents a pound more for our product than we can by sending it to commission men in New York. It can be done, but in the first place we have to have this local creamery organization together so that we can make butter that is uniform in quality. We cannot have the creamery at Shelby making one grade of butter and Fuller's creamery making another grade of butter and hope to have a selling agent in New York handle this butter and give you all the same price. It is just as much the duty of the creamery men to get together and learn to have uniformity of their product and put it on the market in commercial quantities so they can get a good price for it as it is for the farmers, and we need the organization as much and for the same purpose, and there is no better reason can be given for an association of farmers than we can give for an association of creamery men. The creamery men do not know it all any more than the farmers do. We all need to know a lot more, and we can get a great deal of information by getting together and talking things over, coming to an understanding.

Mr. Smith: There is one impression I would like to correct. In establishing these cream routes as I have suggested, I do not mean or do not think it right and proper if there is a man on one road that became angry with one man not to let him go to the other man, but do not let that man's wagon go onto the other fellow's route to pick up his cream. Let the dissatisfied farmer get it to the creamery the best he can.

The Chairman: You cannot make a man go to a certain creamery, he can go to any creamery he wishes to.

Dr. Robinson: Just one suggestion I would like to make along this line and that is, despite the fact that the majority of farmers, the majority of creamery men are honest men as are all classes of business men, once in a while there is a farmer and once in a while there is a creamery man, that is not an honest man, and some of the criticisms of the farmer that they have not a fair test at the creamery is well founded. Those instances have been known and they have not been as rare as they ought to be when the complaint of the farmer that his test has been under read has been substantiated, and in another instance that the buttermaker or tester of a neighboring creamery, in order to get that patron's trade has actually raised the test. To correct this evil, insofar as it might be corrected, the last legislature but one,

if I remember correctly, passed a law making it a criminal offense for a buttermaker or tester to either underread or overread the test, and the standpoint of the dairy and food department is that wherever there is any legitimate reason for suspecting that anything of that sort is going on we may do our best to investigate when we have an opportunity. We want a good foundation to work on in a case of that kind and we want the farmer who is making the complaint to be willing to go to some inconvenience to assist us in the case. We want just such persons caught and discourage that kind of business.

In selecting samples of cream or samples of milk for analyses there is one precaution suggests itself, and that is that very frequently the disagreement in test is not at all as we subsequently find the fault of the buttermaker or tester, but very frequently the fault of the farmer himself in taking the sample, in that he has not realized sufficiently and innocently he has not realized that so much depends on the taking of the sample. It is a very simple matter for a person that is not at all familiar, or even for a person that has had considerable experience in taking a sample of milk, to send duplicate samples of milk to two different creameries or two different chemists and get a different result, not because those two men are not both capable of giving an accurate report but because there is a difference in the fat content of the samples he sends. From the minute that it is drawn from the udder of the cow, the change begins to take place, as the fat begins to rise. In taking a sample for comparative tests, after you have mixed that milk for two or three minutes and you think you have mixed it thoroughly, mix it two or three minutes more. You cannot mix it too thoroughly to get a uniform sample. In general you will not find so much of a difference after all, but, as I said once in a while there is a dishonest tester who takes advantage of that point, and if you can ever get a line on that kind of man we will make it interesting for him if we can because he is an enemy to the dairy business and we do not want him at all.

The Chairman: This is an interesting topic, and Dr. Robinson has brought out such good suggestions, that I think we could profitably spend a little more time discussing it. If a farmer allows a creamery to beat him it is the farmer's fault. We know years ago that the elevator man used to beat the farmers on weight. I can remember when there was a great hustling in Grand Rapids among the people who bought wheat there to see that their scales were right. Farmers got on to the fact that they were taking just a little, just as the sugar trust took out a little of this imported sugar before the government got on to the fact that their scales were not balanced right, and they had to pay a large sum for what they took out. You go to the scales of the wheat buyers in this country today and you will find they are correct. They have learned that there are enough farmers that weigh their wheat when they bring it in, so they have to have their scales weigh correctly. They know the farmers are watching them and they have to be honest whether they want to or not. It is the same way with sugar beet weights. They do not attempt to defraud any more along those lines because they know they would be caught at it and if one dealer was caught at it he would be put down as a robber and would not get any patronage

at all. If you think a creamery does not weigh your milk correctly, it is easy enough to weigh your milk; it only takes a moment, and have your report of it to compare with the creamery's report. If the creamery man knows you are keeping a record, you may be sure his scales will balance before he weighs your milk. It is the same way with this test. If you think the creamery man is not giving you a fair test, find out. Mistakes are liable to be made. People write to the Michigan farmer about them and bring in their complaints. I receive all those complaints and I usually write to the farmer and say to him "If you are suspicious that your creamery man is defrauding you in the test, why don't you find out. I would go in with my can of cream and say 'I want you to test this cream while I am here.' I would get a sample of that cream, divide the sample and have him test part of it, and send one sample to the dairy and food department, and have it tested." Don't you believe that man is going to test more correctly if he knows you are looking after that part of it, and know what you are about? There is no question but he will treat you right. He cannot beat anybody unless the indifferent and ignorant man. That is all there is to it, and if you are indifferent about it, you have to stand it. The way is open to you to remedy it.

Really I do not believe there is as much of this improper manipulation of the test as we hear about because tests do vary and if you test yourself you will find out that tests do vary, and every time it varies you will not blame the creamery man because he is not trying to beat you every time it varies. Farmers ought to be more liberal minded. Look at this in a business way and find things out; if you think you are getting an improper test at the creamery, the first man that ought to know that is the man that does the testing, tell him you believe there must be a mistake there and perhaps he can explain it. He is the first man you ought to go to and the only man. If you find that man does not act as he ought to do about the test, seems unreasonable about it, then I would follow him and I would make him honest or run him out of the country; but do not go down to the corner store and say you believe you are cheated without finding out anything about it because it is unfair, it is not straight business, it is not the way to do business and you will not gain anything that way because you are talking about something that you do not know very much about. I know that because I have had a lot of experience. I have been at the head of a cooperative creamery for sixteen years, and we get cussed up one side and down the other, and yet personally I never tested any of the cream or weighed any of it and have always told our men to weigh the cream and test it honestly. That is the way to do business, is to do everything as nearly right as you possibly can, give the patrons everything there is in it but do not give them any more. If a man's cream or milk comes in and there is a variation and it tests lower, the creamery-man has no right to give him a higher test. He should take a duplicate sample and if it does not test as much as it has been testing he should not say as some do "Rather than make a fuss about this I will call it the same test as before." Don't you know that is as much of a sin as to take the test off from him? That is not right. A man had been sending his whole milk to the creamery and his test ran a little over 4 per

cent all one season. He did not have any milk in the winter time and the next summer he commenced to send his milk again but it tested up to one and one-half per cent lower than the year before, and when he got his first month's check he was very much put out, said he knew that Lillie's creamery was trying "to do him." He came to me, he was a good friend of mine, and I said "I do not know anything about it. I know that man is hired to test that milk as it should be." The man went home and investigated the matter. He had a renter on his farm and in the contract the renter was to furnish his own butter, he was to take the milk to the creamery and the creamery check was to be divided between them. He asked the little boy where they got the butter and the boy said they bought part of it at the store and part of it they churned. He began to investigate, even broke into the pantry and he found the renter would skim the night's milk and then mix that milk with the morning's milk and send it to the creamery. He took the cream off the night's milk and churned it into butter. Don't you see by that man getting interested in the test, by the tester giving him an honest test, just exactly what he was entitled to, he was enabled to ferret out a fraud and after that he thought more of our creamery than ever before. So when your best patron's test goes off a little do not raise it. If you are right stick to it. That is the way with the farmer, he should know he is right and then stick to it. He should be honest in every single instance and in every kind of a deal and then he will win out.

Has anyone else anything to say on this subject? These cow testing associations give a wonderful lot of good information to the farmers about tests. I heard Mr. Rozema say since they started that cow testing association at Fremont that there had not been a single test of a patron of that association above the test at the creamery. We do not become dissatisfied about things we know. We go get dissatisfied about things that we do not know. We are suspicious, the farmers are inclined to be suspicious people, we are all like the Irishman, what we don't see we suspect. We want business organizations, talk these things over, know what we are doing, and then a great deal of this talk about fraud with the creameries will vanish. If it does not and you have a case against a creamery, push it and you will win every single time, but you want some foundation for it.

We will now stand adjourned until 1:30 o'clock this afternoon.



## TUESDAY AFTERNOON SESSION.

Meeting called to order at 1:30 p. m., and opened with a solo "Sing me to sleep," by Mrs. Myers.

The Chairman: The first on the program this afternoon is the Question box.

## QUESTION BOX.

Question No. 1. How high must a 10 ft. silo be to furnish feed for eight cows the year round? Mr. Hull:

Mr. Hull: I will report on that later.

Question No. 2. Mr. Lillie, why don't you keep your cows in during the day and out at night?

Mr. Lillie: That is worth considering too. I used to do that years ago. We kept the cows in the barn in the day time during the hot weather and fly time and had curtains up at the windows, letting them out at night. The reason we do not do that any more is really a practical one from the standpoint of expense more than anything else. It is more practical to have the cows in the barn in the morning when you get up, to have the milking done before breakfast, than it is to send out to the pasture. The pasture is three quarters of a mile from the barn. If a man goes out there and gets fifty cows out of the field, especially in summer, it takes quite a while to get them up and sometimes quite a little while to get them in the barn. Then I think they are more comfortable out of doors in the hot weather than they are in the barn. Our pasture is a permanent one and there is plenty of shade in which they can stand during the hot portion of the day. There are trees scattered promiscuously over the pasture so I think the cows are more comfortable out of doors on a hot day than they are in the barn. Those are the principal reasons, especially towards fall when we have to work by lamplight in the morning to get anything done on the farm because the days are short. It is not much fun to go out before daylight and attempt to drive in a herd of cows. We get them in at night and leave them in until morning and then turn them out.

Member: How much would your cows raise the temperature of your barn above what it would naturally be, in the summer?

Mr. Lillie: To guess at it, I should say ten or fifteen degrees. We keep the doors and windows all open. Really some nights I feel like turning them out because the barn is so hot. We cannot keep the flies out even with curtains at the windows, while outside they can fight the flies.

Question No. 3. Does the milking machine prove satisfactory in the long run?

Mr. Lillie I think it does. A man asked me the other day if I did not have a milking machine would I buy one. I answered the question like this, "I would not sell my machine if I could not get another one, for anywhere near what it cost me," and yet we only use it about six months in the year. That would seem funny too. Just as soon as spring comes

and the ground dries off so we can get to work on the land, we begin to use the milking machine and will use it until a number of cows begin to go dry next fall. I do not know whether we will use it after that or not, but we have not this year and I presume we will not next year. We have fifty-two cows to milk, that represents six men. It is not such a big job for six men to milk fifty-two cows, it is only eight or nine cows apiece. We want to get the oats in just as soon as possible. Practical farmers know if they do not put oats in when they ought to they might as well not have them at all. It is not satisfactory to sow oats when you should be sowing corn, but you can not let up on your chores in the spring, you have them all to do. During the winter we have just men enough planned to do the chores, clean out the stables, draw out the manure, milk the cows and feed the animals. When spring comes just as much has to be done and we do all the field work. Now where does the milking machine come in? Two men will take that milking machine and milk those fifty-two cows and the other men do not have to bother about the milking at all. They can get their horses and tools ready and go into the field and do a day's work, and we use the machines until the cows begin to become strippers or go dry in the fall. Then when we have cows that only give a small portion of milk the milking machine does not amount to so very much because we have to hand strip some cows. You may not get a drop of milk out of them but you cannot tell whether the machine left any or not until you try. It takes as long to put a milking machine on a stripper cow as on a cow giving a big flow of milk and we have to strip her afterwards, so we really do not make much out of that. When the farm work is practically done up we have to keep about the same number of men through the winter and they have nothing to do except the chores. The man who has been washing the milking machine all summer is glad to lay it aside for a while because he does not like to wash it.

Mr. Hull: Would you get as good results by hand milking part of the year and then machine milking, as by one system?

Mr. Lillie: I do not know. When we hand milk the cows regularly and then change and put on the machine, they do not shrink on the milk but sometimes we are suspicious that they do not hold out in their milk as well as if we milked by hand, and if anything goes wrong with the cow we always lay it to the milking machine. If anything goes wrong with the cow when we are milking by hand we think it happened so and that is all.

That is about the status of the milking machine proposition on my farm today. You ask if the cows give as much milk by the machine as by hand, I don't know. I believe the milking machine will do as good or better milking than the average hired man. I never thought it would do as good milking as I could do myself, or as any other first class milker could do.

Another thing, I do not know whether there is anything in it or not, but we have not had anywhere near as much trouble to keep good men on the farm since we got the milking machine as we did before. I do not know whether the milking machine is entirely responsible for that or not but I do know that we are keeping the men longer and they are better satisfied than they were when they knew they had to milk

all the time. Now they know there is a rest from milking for a while.

That is all I can think of that would be of any value to say in answering that question.

Question No. 4. Does it make any difference with the thickness of the cream how fast the milk is fed into the bowl? Mr. Fuller.

Mr. Fuller: I think it does. I know we make hand machines that if they are run at the proper speed and fed all the milk they will take, they will not skim as heavy a cream as if the machine were run half full of milk. If you run the flow of milk about one half what the machine will take it will skim a heavier cream than if you run at its full capacity of milk.

Dr. Robinson: Will it skim any cleaner?

Mr. Fuller: I never found it so, but it will skim just as clean.

The Chairman: If you have your bowl full of milk there is a little more pressure forcing the milk down into the skimming device.

Mr. Fuller: The difference in the butterfat left in the skim milk is so small that it does not amount to anything.

Mr. Smith: The less milk you put through your bowl in a short time the heavier percentage of cream you will have. As far as the skim milk is concerned, the butterfat remaining in it shows practically no difference. Those machines are all set to skim a certain amount of milk in a given time and if you let them alone they will skim clean. If you commence tampering with them they will leave a lot of butterfat.

The Chairman: I supposed the machine was set to take in one-tenth of the volume.

Mr. Smith: Not necessarily so.

The Chairman: Then I had a wrong idea. Mr. Powers, what do you know about this?

Mr. Powers: The volume does make a difference in the cream.

The Chairman: If you feed the milk slowly into the bowl and run the separator not up to its full capacity, you will have a thicker cream?

Mr. Powers: The conductor is set on that machine when it is full to take a certain amount of that milk that they know will carry through that machine and do good work. They have experimented so as to have the conductor just right so as not to have too much milk. The conductor has to be a certain size in order to have the machine do the work right.

The Chairman: Don't they set the machine to take out, for instance, one-tenth of the volume that is run through it? I think if you skimmed slowly and it took out one-tenth of the volume, you would not have as thick a cream as if you run it to its full capacity.

Mr. Powers: You understand the cream is collecting there all the time. There is not enough going into the separator to flush it out. The cream stays in there all the time until you get enough to carry it out at a certain speed. What I want to ask is whether the buttermakers or anyone in the room thinks there would be a difference in the quality of milk. For instance, if the separator was run at the same speed and you run through four per cent milk and three per cent milk through the separator, do you have an idea that the difference in the per cent of that cream would change any?

The Chairman: Certainly or else I do not understand the thing cor-

rectly. You will get a heavier cream by running five per cent milk through the separator than by running three per cent milk through the separator.

Mr. Powers: I contend that is the difficulty in getting a test from the same man's cream. He will tell you his cream is separated in the same way every time but you can scarcely ever get two skimmings from that man that will test the same.

The Chairman: You cannot expect to get it absolutely correct because nobody is accurate enough to get an exact sample every time, and we have to allow for a little difference there. It would be one time one way and another time another way. What is your opinion on that question?

Mr. Powers: I believe the cows do not give the same quality of milk from one milking to another. Would that affect the cream test from the separator?

The Chairman: That certainly would.

Mr. Smith: There is another argument that Mr. Powers and I had on foot last night. I was at the Agricultural College in Pennsylvania and did some experimental work along that line, in fact we did a great deal of it. As I said last night, we find a small variation, but it is a very small variation, between these different percentages of butterfat. For example, if we skim a lot of milk, then turn around and run that skim milk through the separator again, are we going to get one-tenth of that volume of skim milk out through the cream spout? Or take water and run it through the separator, are we going to get one-tenth of that volume of water out through that cream spout? It all depends upon the centrifugal force and the weight. You get something out through that cream outlet, you are bound to because there are certain portions of that skim milk lighter than the other portions, that will be brought to the center. If you mix oil with water, you will get oil through the cream spout and the water from the skim milk spout.

Member: I saw not three weeks ago a man pour water in the separator and the water went out of the cream spout.

Mr. Smith: In the different experiments we carried on, where we ran the skim milk through the separator, we got a small portion of cream through the cream outlet, but it was a small portion.

The Chairman: If you run five per cent through a separator and then run three per cent milk through, will you get the same per cent of cream in each instance?

Mr. Smith: No, it will probably be a trifle lighter but there will not be much difference.

The Chairman: Of course there will not be much difference; there could not be much difference but there is a little.

Mr. Powers: I believe that right there is a chance for a good many patrons who have separators to make a difference in the test, by the amount that is put through the separator at different times.

The Chairman: That would not make so much difference because the herd test of milk does not vary much.

Mr. Powers: I mean the amount of milk that goes through the separator. If the separator is not filled properly, if the receiver of the separator has not been filled up during the whole running it will make a difference in the quality of cream.

Mr. Hull: Mr. Smith, don't you think it makes a lot of difference in the test of a man's cream, as to how much fresh water he uses?

Mr. Smith: There is where the largest variation comes. Some two years ago I had the opportunity of driving out on a man's farm. He was using a separator. His cream tested 42 per cent during the summer, but during the month of November, when I visited his place, the cream test dropped to 18 per cent and he said he could not understand it, that he never changed the cream screw on the separator, that it had always been run by himself and kept at the proper speed. I asked him how many cows he milked last summer and he said eight and that he was milking one at that time. I asked how much water he used to flush his separator and he said two quarts, and that of course decreased the test of the cream.

The Chairman: A short time ago a subscriber to the Michigan Farmer wrote in and asked if flushing the bowl of the separator would change the test of his cream. He might as well ask if adding water to the cream changes the test of the cream. When you get through skimming you pour water in the bowl, flush the bowl out and that runs into your cream, does it not? Some water will run through into that cream. Doesn't that reduce the consistency of that cream. How can a man ask such a question as that. Of course it is perfectly proper to do that because you want to rinse out the bowl and do not want to lose any cream. It is like in the creamery when a lot of cream cans come in and you empty them in the vat, then rinse the cans out into the vat. There is water in there but you cannot help that as you want to save the cream. That man certainly should know his cream would not test as much after he put some water in it as it did before. Sometimes if you take a little more water to rinse out the separator bowl your cream will not test as much at the factory. There is a chance right there for your cream to vary in the test a little.

Question. No. 5. Is it profitable to feed silage the year round?

The Chairman: I talked on this subject this morning and I think anybody who heard me talk would think in my opinion it would be profitable to feed ensilage the year round. The question comes in there as to how much pasture you can have. If your land is all good, tillable land the dearest feed you can give your cattle is pasture. There is no doubt about that, but here comes the question, can you get labor enough to handle a dairy herd and feed them the year round in the barn and not have any pasture? There is a question each man has to settle for himself. There is hardly a farm in the country but has some waste land in it that is a permanent pasture. For instance, I have on my farm forty acres with the creek running through and it is not practical to plow it. I want to pasture that. I do not want to feed the cows the year round in the barn, I would want them to help themselves to what grows on those forty acres. If your farm is all tillable land and you can get the help to handle your herd, you cannot afford to have any pasture; but you must take all these things into consideration.

Question No. 16. What is over-run?

The Chairman: Over-run is the excess of commercial butter over butterfat in churning.

Mr. Hull: It is what is in butter that is not fat.

The Chairman: That is another good definition. When you test **milk** or cream with the Babcock test you get the actual pure butterfat. It does not give you any moisture or any other substance but simply the pure fat; it does not measure the casein, or milk sugar or anything, simply the butter oil or fat in the butter. You say that cream tests 40 per cent, that is 40 per cent butterfat. Supposing you get 100 pounds of cream testing 40 per cent butterfat; you take the 100 pounds of cream and churn it and you will get more than 40 pounds of butter. You cannot possibly churn it, if you get the butter out of the buttermilk, but you will have more than 40 pounds of commercial butter. Now then, the difference between the churn yield and butterfat is over-run, or as Mr. Hull says, that in butter which is not butterfat. What is the over-run? It is a certain amount of moisture, certain amount of curds or casein and salt. You know there is salt because you have added salt to it. Water, casein and salt are incorporated in commercial butter when you churn the cream to make the churn yield more than the butterfat. That is over-run. Does that answer your question? If the condition of the butterfat is just right, that butterfat will have the power of absorbing a greater amount of moisture one time than it does another. If the conditions are just right, there will be quite a large amount of casein one time more than there is another, depending on how much you wash it and how much water there is in the churn when you wash it with the salt, and you know the amount of salt in butter varies. One time you get it so it is highly flavored with salt and perhaps with the same proportion of salt the next time and it is not highly flavored with salt. Salt varies. That is the different with butter-makers. All buttermakers think they ought to have the same salary, yet one buttermaker is not worth his board while another is worth a good salary to a creamery just on over-run, to say nothing about the quality of his goods; but the buttermaker who studies the proposition so he can control the moisture, casein and salt and have a uniform over-run makes money for his creamery; while the buttermaker who does not and makes butter by the rule of thumb, one time has too much moisture and another time has not enough moisture in it (as he can easily do if he does not know anything about it) is losing money for his creamery. That is quite an important question and yet, as I say all buttermakers think they ought to have the same wages because they give the same amount of physical labor in a creamery and, as Mr. Hull said in his talk last night, a man does not get paid for just the physical labor that he does. The buttermaker that uses his head and understands those things and controls those things is a valuable man in a creamery, and to him should be paid good wages.

Question No. 17. Which is the more important, clover hay or silage?

The Chairman: Mr. Hull will answer that.

Mr. Hull: I should say we are getting to a time in Michigan when perhaps silage is the more important because we can grow alfalfa to take the place of clover hay. There is no use talking about that, it is neither here nor there. There is nothing practical about asking such a question because no man can make a maximum success of dairying without providing for both of these. Of course you say to make a practical success you can grow clover. If you cannot grow clover, sow peas

and oats in the spring, harvest and cure all that hay and get something that will come as near taking the place of the clover hay as you can. You cannot get along without both those feeds and make milk profitably any more than you could get along without windows in a house. It requires certain things to make milk and make it profitably.

The Chairman: They are both necessary for the most profitable production of milk, clover hay and corn silage. Another illustration occurred to me while Mr. Hull was talking,—you might as well ask which is the more important in a house, windows or doors?

Question No. 18. Does it pay to build a silo out of 2x4's if you have the lumber and can do the work yourself, buying the rods?

The Chairman: There is no question but it will pay to build a silo that way if you have the 2x4's. As I told you this morning, the important thing is to get a silo. The least important thing is what kind of a silo. If you have the 2x4's and want to make your own silo you can make it. Simply build the foundation for your silo as you would if you were going to buy one already manufactured; then take your 2x4's, nail them together so they will not shrink in the summer and get out of shape. There are three silos in our county built in this way. They got 60 penny spikes and spiked the 2x4's together. One-quarter of the way round they put in a 4x4 so as to stick out three inches. Then they bored holes through that where they wanted the hoops to come, and ran the hoops through those 4x4's. The hoops could not slip down and it makes a good silo but it takes a lot of work to nail all those 2x4's together. Your arm will ache before you get those spikes in there. You can make the silo out of 2x6's by boring into the edge of the 2x6's and driving the nail in.

Mr. Taylor: What is the use of nailing 2x6's together?

The Chairman: So when the staves shrink from dry weather they will not weave out of shape or fall down.

Mr. Taylor: Mine will not weave out of shape or blow down. I put it up with 4x6's instead of 4x4's, allowing them to project beyond the outside wall of the silo four inches and made each hoop into four pieces. Each rod passes from one of these 4x6's to the other. It is screwed up tight and I do not believe it will fall down, and the staves certainly do not get out of shape. It may rot because it is made of hemlock. I would like to ask Brother Hull how long it will last?

Mr. Hull: You have asked me a lot of easy ones this afternoon. I have had a hemlock silo for ten years and it is all right yet. I am sure it will last ten years longer. We put a wood hoop at the joints and they shrink and swell without any injury.

Member: Mr. Lillie said in the Michigan Farmer where the joints were made it was advisable to put in pieces of steel to splice the staves.

Mr. Hull: Well we put in those splices, making an 18 foot stave and to keep it there a nine, so as to make an air tight joint. Of course I put the 9 foot stave on bottom and the 18 foot stave on top. Then we put the wood hoop around it. Then we got up to the 18 foot and double hoop it there. Then it is double hooped at the top.

Question No. 19. Will it pay to put dry corn fodder in with the silage?

The Chairman: Mr. Myers will you answer that question?

Mr. Myers: I do not know, but it is not practical because we would not have dry corn fodder at that time.

The Chairman: I think the idea of the man who asked the question was to mix some dry fodder in with the green corn when he was filling the silo the same as you put straw in between layers of clover hay when you think the clover hay is too green to keep. Straw absorbs some moisture from clover hay and makes it keep. You do not want to put any dry stuff in with your ensilage because nice mature corn, containing just its natural amount of juice, does not make too much moisture to have that ensilage settle and keep well. If you put dry stuff in the silo you must add moisture and you want to add enough moisture to dry stuff to make it as moist as the green would be with its natural juices. If the questioner means would it pay after you husk a portion of your corn to put the stalks into the silo and make ensilage of them, if you have room in the silo you can do it. It is easy enough to put the water in. Just fix up a little spiggot so it will run down to the blower, and the blower soaks the air in so it will draw the water in.

Mr. Hull: If it is corn dry enough to husk, unless you put it in pretty slow you will want several streams as large as a led pencil.

Member: How is it where the leaves are dry, would you say to put the water in there at this time?

The Chairman: You ought to have a little if the leaves are dry but you will not need so much because the stalks are full of sap, but do not leave the corn on the ground until the leaves get dry. Put it into the silo when it is fresh. If you leave it on the ground too long it is going to mould and the cows will not like it as well.

Member: I helped fill a silo this summer where they cut the corn in the forenoon and put it in in the afternoon, but by four o'clock the leaves were dry enough to break.

Mr. Hull: Unless the corn was too dry, that would not need extra moisture.

The Chairman: We have in this state an educational scoring contest and every creamery and cheese factory in the state has been asked to send a sample of their product. We go to the expense of getting the government expert on the Chicago market to score this butter and he sends back criticisms to the creamery men. Now what is the good of it? If there is no benefit we want to quit it because it is a lot of bother to me personally. Mr. Powers will now talk to us on this subject "The Object of Scoring Butter and Cheese and Milk."



## THE OBJECT OF SCORING BUTTER, CHEESE AND MILK.

MR. E. S. POWERS, RAVENNA, DAIRY AND FOOD INSPECTOR.

Mr. President, Ladies and Gentlemen:

The chairman thought about ten minutes would be sufficient time for me to use in talking on this subject. I get a good deal out of such meetings as this, whether the farmers do or not and I think the most we get out of such a meeting as this is what we need the most, a little enthusiasm in our business. I know when I was running my creamery at home and was very much interested in the business, what did me the most good of anything was to attend a dairy meeting, not that I always learned so much but I certainly received a lot of benefit from the enthusiasm which such meetings aroused. I went back home better satisfied with myself, and the more meetings of this kind we attend the more we will be trying to do a little better all the time. There are new things coming up continually, calling for thought and study on the part of the dairyman and creameryman, in order to keep step with the times:

There is not a thing produced on the farm, raised on the farm but the commercial value of that article must be determined by a certain standard of points when it is taken to the market. Of course this is all done by one or more of the five human senses, seeing, smelling, hearing, tasting and feeling. If you buy a horse you use three senses,—seeing, hearing and feeling. You have in your mind your ideal of what a good horse should look like, and you feel around his legs and ribs to see if he is all right; you listen to his breathing to see whether he has the heaves or not. You use the same senses in picking out a good cow. You use your eyes, and I have seen cows that looked like nice big cows that had udders that could not be looked down upon, you had to get down and look up to them, so you see you have to use your eyes in such cases as that. So it is all along the line in all kinds of farm products. Potatoes are judged in different ways, according to their appearance, quality, etc. Eggs are something that are hard to determine the real condition of, although there are ways by which we can tell fresh eggs, but the value of everything has to be determined in that way.

We come to butter. We have to use our eyes and we have to use our nose, some butter you have to see and some you do not have to see to judge the quality. You have to use those senses to determine the value of that product. Now by the means we have of scoring and testing butter, there is just one way of determining the quality of butter, and that is by scoring just the same as any other farm product is valued.

Scoring butter is nothing more or less than a comparison, and in judging this butter a man forms a good clean taste. He knows the difference between good and poor butter, just the same as any good judge knows the difference between a poor and a good horse. He educates his taste so that he can tell whether the material put into that butter was good or not, and he can tell where any carelessness crept in in any

stage of its life. I do not pretend to say that I have arrived at that stage but I say that a man that has different kinds of butter coming into the market has a comparison there. He picks out a tub of butter—the taste is nice, clean, has a nice mild acid flavor and he takes that for a comparison or standard. I do not believe there are any two men that could go over a lot of butter and score it and give it just exactly the same score.

Dr. Robinson follows me and he will give you the final points of this argument. He will bring out all these points to show why it is necessary and what benefit it is to your customers to have this butter scored. I believe it is just as essential as anything you have to say in order to determine its real value, because if that butter goes on the market as a second or first there is a big loss there for somebody, and if the creamery man cannot get a price for that butter he naturally has to fall back on the manufacturer and the manufacturer cannot pay the farmer as much for it. This method of letting the separators stand over night without being washed can be determined in scoring the butter. The judge calls that "dish rag flavor."

Mr. Taylor: How do you get a dish rag flavor when they have not used the dish rag?

Mr. Powers: Dish water flavor would perhaps better describe it.

The subject touches on cheese and milk. I am going to leave it to Dr. Robinson to discuss those finer points because he will go into more minute details in talking about the different kinds of animal life that is in the milk. I will leave the doctor to discuss those finer points, but I will say it is quite a vital point for the farmers of Michigan to consider at this time, is the quality of their butter.

It is a pretty good tab on the creamery to send a tub of butter to the scoring contest every month. I know I have profited by it. Mr. Lillie has profited by it wonderfully. I know it has benefited his creamery over there. To make a plain statement that creamery over there was having trouble, just the same as some creameries in Oceana county are having. They did not know what they were going to do, and were afraid they were not going to have a market for any of their butter. I did all I could to suggest some way to improve the value of their butter. They kept trying this and trying that different method and now they have adopted a method by which they are making as good butter as they ever made since the Coopersville creamery was started, and I believe this has been accomplished through the scoring contests. Some butter-makers are afraid to send a tub of butter there because if their butter receives a low score that will give them a bad reputation, but I do not think they should look at it in that way, they ought to have the good judgment of Mr. Credicott and Mr. Lillie on the quality of their butter. Mr. Credicott is an expert in judging butter, and I know I have received benefit from his criticisms.

I have heard buttermakers say they have sent two tubs of butter to the one scoring contest, both tubs churned exactly alike and did not receive the same score on them. I do not believe anybody can judge two tubs of butter exactly the same, it is a hard thing to do. If you have two tubs of nice clean flavored butter, how can a man tell which is the better, and he has to be an expert to judge on the quality and grain of that butter in every respect. There are many points to look at, the

workmanship, color, body, etc. The appearance of the package is also taken into consideration. It is a hard job to have a tub of butter in this corner, then go through a whole lot of butter and come over here and judge another piece of butter just as good and get them both alike. You cannot do it but you can learn a whole lot about it.

The Chairman: Dr. Robinson is on the program for the discussion of this subject.

### DISCUSSION.

DR. FLOYD W. ROBISON, STATE ANALYST, LANSING.

Mr. President, Ladies and Gentlemen:

Regarding the incident that Mr. Powers referred to as to the different scoring of two identical packages of butter, I received a letter not over a week ago from some buttermaker or creamery man (I do not know it might have been from some one here for all I know; at any rate I shall tell it) in which he gave the result of two scorings. He said he sent one tub of butter to the Michigan educational scoring contest, the other tub from the same churning to Chicago, and the score of his butter at the Michigan educational scoring contest was  $93\frac{1}{4}$  while the other tub at Chicago scored 93. He said "I would like to have you tell me what makes that difference of one quarter point." It did not seem to me to be necessary to answer the letter but I did. He quoted further the results of the analysis of the two samples of butter so far as butterfat was concerned. The sample sent to the Michigan educational scoring contest contained  $86\frac{1}{4}$  per cent of butterfat, the one sent to Chicago contained  $85\frac{1}{2}$  per cent butterfat, so there was a little greater difference in accounting for the butterfat, three quarters of one per cent in the butterfat in the two different tubs. I wrote to him to this effect that I thought if he sent two samples of the butter to the same contest and got as near a uniform score as he did on those two samples of butter that he might congratulate himself indeed. I do not see how it is possible for an expert scorer to score two tubs of butter both from the same churning, and get as near as those two samples showed at entirely different places. That shows there is some foundation upon which butter is scored.

Of course it is a comparative test merely, and my private opinion is that the butter scored by Mr. Credicott and other butter experts (and he is an expert without question) is scored too high. I do not think they recognize enough difference between different makes of butter, but undoubtedly it is their desire to encourage the buttermakers rather than discourage them and if they exhibit in some instances the real amount of difference that there is between butter some buttermaker would become discouraged, would look at it in the wrong light and refuse to send their butter.

There are buttermakers today who say "I would like to know what good an educational contest is. It simply lets the commission man

know the weak points in the butter and allows him to take advantage of our price." I do not see it in that way at all. I understand the object of the butter scoring contest is not to furnish a market for the butter of the creameries of the state, I understand the object of the scoring contest is to furnish a basis of criticism for the butter, so the butter-maker may learn from other people their opinion as to the quality of the article he is producing, and if he receives a low score he ought to be thankful that those things are pointed out to him; if he receives a high score he ought to use it as a guide of determination to always continue to get a high score. These are the objects I see in the educational scoring contest.

That illustration that the gentlemen sent does furnish one other example, that is butter from the same churning in two different tubs that showed a variation of three-fourths of one per cent butterfat, is not a great variation. In fact it might have been two per cent variation in butterfat in the same churning put in two different tubs. Butter-makers know if they test their butter there is one end of the churn that is liable to be quite a good deal different in composition from butter in the other end of the churn, due to the fact that there is a different percentage of moisture in it, a different percentage of salt, a different percentage of butterfat. Those things vary and that is the reason why we urge that every buttermaker shall pay attention to quality in butter and not quantity. Quantity enters in largely any question whatever, because the quantity of the product the buttermaker turns out is some indication of that man's value, but I would not want a buttermaker to spend his time and energy in producing quantity in butter; I prefer that he spend his time producing quality in butter, because when he has demonstrated that he can produce quality in butter then it is time for him to be concerned with the question of quantity, but not until then. Quality comes first. It is the quality of the product we have to take into consideration more than the quantity.

The Chairman: This subject is open for general discussion and we would be very glad to have anybody ask questions or offer some remarks.

I asked Mr. Credicott one time why he gave a certain tub of butter a higher score than he did another, and his reply was "That is the butter that the market demands. That is the butter that sells the best on the market." That is where they get their cues. We are making butter to please people because we want to sell the people our butter and get all we can out of it. We have to make goods they like, and if it takes a mild acid flavored butter to please the people in New York and Philadelphia, and they are willing to pay more for that butter, that is what we want to give them. When you send them butter that contains off flavors, flavors brought about by old stale cream, and the commission man sends that out to his customers, they stick up their noses and say "We do not want that kind of butter. I pay a good price and want good butter" and it comes back to the commission man, and the commission man goes back to the creamery, and the creamery has to go back to the farmer.

The educational scoring contest in the state of Michigan has not done the good it ought to have done because the creameries have not support it. That is all the trouble. As Mr. Powers said, the creameries that have stuck to the educational scoring contest have learned

lessons that have been worth dollars to them, our creamery has, it is a check to the buttermaker. Some of the buttermakers would like to send butter to the scoring contest but the management will not let them because they do not get as much, within a cent or two a pound, for that butter after it has been scored and put on the market with a miscellaneous lot, so they lose a little on that tub of butter and they will not allow the buttermaker to send it. They are making a serious mistake. They could afford to give a twenty pound tub of butter every month and say nothing about it as a check on the buttermakers, to know what he is doing, to see how their product compares with their neighboring creamery's product. That is the only way to improve, but people do not look at this thing in the right way. I cannot convince them and I am not going to worry about it if I cannot. We will take what butter comes, score it and make the criticisms and do the best we can, and the people sending the butter will receive the benefit.

The Coopersville creamery could afford to pay the expenses of Mr. Credicott every time he came to Michigan to score the butter. I believe that is true, that the Coopersville Creamery could afford to pay Mr. Credicott's expenses every time he came to Michigan to score the butter for the good they got out of it, but did not have to do it because the state pays the bill. You people who do not send butter to the scoring contest are helping pay his expenses and not getting any benefit out of it.

An expert can tell a whole lot about butter by scoring it. Mr. Credicott can tell whether that cream was ripened in a room next to where cabbage was kept or not; he can tell every other flavor that ever got into butter. He has educated himself up to that and his taste has developed so he can detect every imperfection in butter. We have put up a job on Credicott. One creamery has sent in different tubs of butter. He might vary a half of one per cent in the score of the butter, but his criticisms on both lots would be just the same. You need not worry about that. We have churned gathered cream separately and put it in a tub by itself, saying it was from whole milk, but he could tell it every single time. He did not know a thing about it and yet he could give a history of the whole business when he put the trier under his nose, took a taste of the butter and gave it a close inspection. Somebody says you get no help from the scoring contest when your butter is scored because the judges say "Old stale flavor." Well that is all they can do. They cannot go back to that creamery and see you take that old stale cream to make butter, but they can tell you that that is where your trouble is and then it is up to you to remedy it. If you continue to receive old stale cream and make it into butter you are going to suffer for it, and if you are satisfied in getting seconds or getting a moderate price for your butter rather than make an effort to get good cream to make it out of, nobody has any fault to find. It rests with you but you know what the result is. The question is how can you remedy it. If you are getting old stale cream, there is the problem, how are you going to remedy it? The question was brought up here in a practical way this morning, do not pay as much for old stale cream as you do for good cream. When you get moral courage enough to do that the question is settled, but the creamery men, Fuller, Meyers, Powers and everybody else, have not moral courage enough to do it.

Mr. Powers: We have more moral courage than we have money. That is where we are lacking.

The Chairman: As I said here yesterday, a farmer can as well have a good quality of cream to send to the creamery as a poor quality but some of them will not do it unless you make them and the only way to make them is to pay according to quality and then they will do it. My friend every farmer in the neighborhood is interested in this because if a man sends in poor cream and it is brought in year after year and it makes poor butter, you suffer with the man that sends in the poor cream and you ought to insist that that fellow does not send in poor cream. You will have to see that the people in your neighborhood do send in a good quality of cream because it will affect your pocket-books. The scoring contest and the market are the only ways for you to find out, as Mr. Powers has said, the market value of those things. You have to score them you have to mark them, you have to grade them according to the market and to the demand for them, and if we stop all that we would not know anything about the quality or the value of our butter.

When you get right down to it it is absolutely necessary to score the butter in order to grade it because when it goes on the market we have to sell it for what it is worth. We can stop this poor butter if we only get at it and insist upon it. It may be the creamery is not doing all it ought to overcome flavors, but I tell you if the creameries are not they ought to be blamed very largely. I went last week up to a meeting in Menominee county and going through Chicago I met Mr. S. B. Shilling, secretary of the National Buttermakers Association. He told of a centralizer up at St. Paul who paid his patrons 29 cents a pound, Elgin price, for butterfat. There was some large quantity of butter made from that cream and when it got to New York he said it sold for 25½ cents a pound. There is no money in that and this centralizer sent back word to cut out the poor cream if they lost their entire trade. The only way to do is to cut out the poor cream and make the farmer take good care of his cream and deliver nothing but a good product at the creamery. If you do not do that you will ruin your creamery.

Mr. Powers: What plan could you suggest to get at the fellows that do not attend such meetings as this?

The Chairman: The best way is to send their poor cream back and say "We cannot use this kind of cream. You will have to take better care of it or we cannot use it." A man at our creamery sent in some cream. The cows had been eating leaks and the buttermaker detected the odor in the milk before it was dumped. Don't you see if that can of milk had gone into the vat it would have spoiled the vat full of cream? I cannot make myself believe that that patron knew there was a leaky taste to that cream. The manager got a little churn and churned that cream separately and returned it to the patron, saying "Eat it yourself, we cannot sell it." You could do that with some of your worst customers. Let them see what kind of stuff that cream makes. If you get a real bad can of cream from a man, churn it separately, put the butter in a jar and send it back to him.

Mr. Taylor: Would it be humane to send back some of the stuff?

Mr. Myers: I think there are finer points. If a man sends leaky

cream to the creamery it is easy to detect it, but we have considered the subject all winter and none of our theories have worked out. I believe that cream and milk as well can be affected a little and yet injure the quality of the butter. Perhaps Mr. Credicott could detect the different causes but it will bother a man here to detect all of the little differences in milk. While the milk may not be all off, there may be little defects in it. You cannot have a stable without dirt in it.

The Chairman: Why should it all be there? We only have to use reasonable care on the dairy farm to have a first class quality of butter.

Mr. Myers: We run up against some things that bother a little. I am not positively certain, although I take all the pains I can, that my milk is absolutely perfect. I think if churned alone it would make extras. If you look at the report of the scoring contest at Grand Rapids you will notice how many samples scored 93.

The Chairman: There were only a small number I admit.

Mr. Myers: We are having a good deal of trouble this winter, and the creameries all over the state are in the same position.

The Chairman: The markets are discriminating more and more against off flavor butter. Butter that sold as extras a couple of years ago will not score as extras today.

When the dairy division of the food department was first organized we had a complaint from a creamery in the southwestern part of the state where they made a contract with a commission man in New York City for a certain price, based on the New York market, butter to score extra. In the winter the butter did score extra, but in the hot weather the butter went off and they wrote to the Dairy and Food Department for help. Mr. Hull and Mr. Shellenberger went into that community to help the people. After they got through with that community they had butter that scored higher than it ever did in the winter. What did they do? They simply asked those people to have a general cleaning up. The cans were not properly washed. In this instance the buttermaker's churn was not properly washed.

Mr. Hull: The greatest difficulty was with the patrons, where they let the milk stand around the stables and get the odor from them.

The Chairman: After those inspectors had been through that neighborhood, and I think in this instance they went to every patron of the creamery there, the quality of the butter improved and it was all brought about through a general cleaning up.

Mr. Hull: We sent back the milk from twenty patrons the first morning, and then we made a note of all of those that were not first class; out of the 120 patrons there were a little more than one-half whose names we noted and visited their farms. We looked at their cows and stables, asked where they kept their milk, and all that sort of thing. Those that had dirty cans as well as off flavored milk were visited.

Mr. Myers: I have always taken pride in our creamery patrons. We have had a pretty clean lot of patrons. Mr. Rabild came up here one day and I talked with him and he said he did not find a dirty can. That is something unusual. We may have all become a little careless but we have worked pretty hard. The creamery may have made mistakes.

The Chairman: Do you use a good commercial starter?

Mr. Myers: Mr. Powers said it was not but when we got a good starter it did not remedy the difficulty, so we are still in trouble, but not quite as bad. We have always made good butter, but we have always been bothered a little in Oceana county every year but got over it in a short time but this time it continues. We are making butter that sells with the average butter in the state now, but still it does not sell for extras. I received a letter last week from a house in Detroit giving me a quotation on butter which scored extra, I think it was 28½ cents, it might have been 29 cents, but he said very little of the butter which comes in scores extras. The bulk of the sales is around 26 cents.

The Chairman: That has always been the case, the bulk of the butter has always been below extra.

Mr. Myers: Then we have been making better butter than the average.

Mr. Hull: I could have told you that several years ago.

Mr. Myers: Have you any help for us?

Mr. Hull: Mr. Lillie said in a kindly way that we succeeded in doing some good, but we have tried in some places and failed. Over here at Grand Rapids Mr. Rudell had a skimming station. I went into Rudell's place and tested the butter and said "What has gone wrong with your butter? It is not as good as when I was here before?" He went in there with me and tested the butter and began to ask the butter maker questions. Mr. Rudell said "We cannot ship this butter east, we will have to dispose of it here. He was of course very much concerned about it because it meant a loss to him. I examined the cream and found the poor cream came from Grant. The flavor of it was a little different than anything I ever ran across before. I went up to Grant and I found two or three samples of milk that were brought in there to the skimming station that I got a little of that flavor in, but not nearly as strong as I did at Grand Rapids. It was along in October and quite cold. I turned the milk back and saw those patrons. I found some of the patrons' cows were eating cucumbers or potatoes that had been frozen. We tried to stop that, did not take the milk, and I presumed it came from that. We thought we had it all fixed up and I went to Grand Rapids and found the butter was better but was not quite right, and the cream from Grant tasted that way yet. Another inspector went there and visited there. We thought we stopped all that and got the farmers to promise not to let their cows eat frozen potatoes or cucumbers, but it was nearly spring before Rudell got rid of those flavors in his butter. Mr. Haven and Mr. Rabild were up there and I think they sent some cream to Dr. Robinson but we could never tell for sure what was the matter. While we do succeed sometimes in improving things, we sometimes meet our Waterloo.

The Chairman: I think we will have to pass on with this subject now. The next subject on the program is Commercial Feeding Stuffs by State Analyst Robinson.



## COMMERCIAL FEEDING STUFFS.

DR. FLOYD W. ROBINSON, LANSING.

Mr. President, Ladies and Gentlemen:

The legislature of 1905 passed a law regulating the sale of commercial feeding stuffs in the state of Michigan. This law was passed largely for the benefit of the farmers and dairymen throughout the state, so that in going upon the market to buy concentrated commercial feeding stuffs they would have some basis as a comparison of values. At the time this law was passed there were a great many feeds upon the markets of the state that varied greatly in commercial value and yet did not vary so greatly in price. For example, we found one sample of an oat feed that possibly had four or five percent protein in its composition, selling for exactly the same price as a ground corn and oat feed which had 10 or 11 per cent protein in its composition, one of which was almost worthless as a food and the other of great value as a food. There was absolutely no basis of comparison between those two foods at that time, and this feeding stuff law was enacted largely for this purpose.

The law provides that whenever any manufacturer shall sell in the markets of this state any concentrated feeding stuff, he must pay a license of \$20.00 for each and every compound he sells into the treasury of the state to help defray the expenses of inspection and analyses, and he shall print on outside of every bag or sack or car a label showing the percentage of protein, percentage of fat or other extract, the crude fiber and the free extract. The reason for these various different points being given in the analyses of feed is to give the feeder some idea of the real value of that feed for feeding purposes.

Protein, you know, is a substance by which we usually judge the practical value of a feed. For example, we say that one feeding stuff contains 30 per cent protein and another 42 per cent. Other things being equal, the one containing 42 per cent is of more value to the feeder than that containing 30 per cent because, in Michigan at least, it is the concentrated food from a protein standpoint that we are looking at and not concentrated food from a carbonaceous standpoint. As I explained briefly last night, the protein of the food is the lean meat portion of the ration, the egg, the albumen or gluten part.

The ether extract of fat of a feed is the oily portion of the feed and it has a certain distinct value in the ration.

Nitrogen, free extract portion of the feed is the starchy portion, nitrogen free. That is free from nitrogen, does not contain any nitrogen. The meaning is somewhat misleading.

The crude fiber portion of the food is the woody portion.

There are two particular points of interest in a commercial feeding stuff with which we shall be concerned in the selection of commercial feeding stuffs. That is assuming that most dairymen and most farmers find it convenient and somewhat necessary at certain times of the year to go on the market to buy certain commercial feeding stuffs, such

as oil meal, cottonseed meal, ground corn and oats, bran, gluten meal, malt sprouts, dried brewers' grains, dried beet pulp and various commercial feeds, they are enabled to pick out that feed which contains the highest percentage of protein for the lowest price. That is we try to get a unit of feeding at a certain reasonable figure. Other things being equal, that feeding stuff is most valuable for feeding stuffs which contains the highest percentage of protein; that feeding stuff is most valuable, other things being equal, which contains the least percent of crude fiber. I wish you would firmly fix these two points in your mind, that a feeding stuff is valuable because of a high percentage of protein and in the second instance because of a low percentage of crude fiber. Protein and crude fiber work antagonistic to each other. Protein is a valuable and necessary ingredient in food stuffs, crude fiber is necessary in food stuffs but it is not an item with which the dairymen can be concerned in purchasing feed stuffs, because where there are any forage crops on the farm he has a sufficient amount of crude fiber so it would be a waste of money to purchase foods high in starchy crude fiber. Consequently he selects that feeding stuff with a low percentage of crude fiber.

A great many of the commercial feeding stuffs now on the market are analyzed and advertised solely from the standpoint of the protein content. We are trying to correct that as rapidly as we can. Quite a few manufacturing concerns in the state the past year have persisted in sending out their literature regarding the value of their feeding stuff and mentioning only the percent of crude protein and by that compare it with some other well known product such as bran, which contains only 16 per cent protein. If a feeding stuff contains 30 per cent protein and 20 per cent crude fiber it is not as valuable a food as is bran, which contains 16 per cent protein and 8 per cent crude fiber, because that higher per cent of crude fiber neutralizes the effect of the high per cent of protein, and those things should be carefully borne in mind. To illustrate more clearly, you know what you could do with feeding a dairy cow on oat straw. Oat straw is a valuable adjunct to a feed but you know you could not expect to produce milk by feeding a dairy cow on oat straw alone. The reason is not that there is not protein in oat straw because there is, but because there is too much crude fiber in oat straw so it uses up practically all the protein there is in the oat straw to digest and utilize the amount of crude fiber that there is present. The cost of the digestion of oat straw to the animal economy is more than it is worth figured in the ration alone, so we figured in balancing the ration that we will have such a percentage of protein as does not contain an excessive amount of crude fiber, and we desire to furnish that crude fiber and the other starchy portions of the food from the forage we can grow cheaply on our own farms rather than going into the market and paying protein prices for crude fiber.

Suppose we get feed containing 20 per cent protein and 15 per cent crude fiber, for which we are paying a certain specified price, we will say \$20 a ton. Not only are we paying \$20 a ton for that protein, which is possibly quite a little more economical than it may be in a feed which contains 40 per cent protein, but we are paying \$20 a ton for that fibrous material in the stuff, and we are losing a great deal of money

because of paying that exorbitant price for that raw crude fibrous stuff.

So the thing to take into consideration is purchasing a commercial feeding stuff on the market is first that we get a high percentage of crude protein and that we get a low percentage of crude fiber. If we keep those two points well in mind we might almost well afford, so far as the element of purchase is concerned, to ignore the oil and nitrogen free extract in the food. They will take care of themselves but if we buy that food which has high protein content and low crude fiber content that food is a valuable food to us. For instance, we have two feeds containing 30 per cent crude protein, both selling for \$30 per ton; one of them contains 10 per cent crude fiber and the other 5 per cent crude fiber. There ought in no instance, providing they are both palatable foods, be any hesitancy as to which you should select. One contains 30 per cent protein and 5 per cent fiber, and the other 30 per cent protein and 10 per cent fiber. The one most valuable is the one containing 30 per cent crude protein and 5 per cent crude fiber, because the animal has to concern itself with the breaking down of only 5 per cent cellulose in one instance, while in the other instance it has to break down 10 per cent in order to utilize the good in that food.

That is what the commercial food law is, to have those feeds recorded so we can look on the labels on the sack and tell whether you are getting a feed containing a higher per cent of protein or a low per cent of protein, whether you are getting one which has a low percentage of crude fiber or a high percentage of crude fiber and work these two points against each other, remembering that the feed is valuable in the first place because of the high per cent of crude protein, and valuable in the second place because of the low percentage of crude fiber, and if it is not stated on the package you can assure yourself as to what the crude fiber is. We, as far as possible, compel the manufacturers to place the percentage of crude fiber on the label but they are not all doing it at the present time.

#### DISCUSSION.

Member: Would you judge the goods by the ratio between one and the other?

Dr. Robinson: Yes Sir.

Member: Suppose you had 20 per cent protein and 10 per cent fiber, what about the other constituents? That would leave 70 per cent of something else. Should we take that into consideration?

Dr. Robinson: I would not worry about that at all. That will take care of itself.

Member: Is molasses feed value for cows?

Dr. Robinson: Molasses acts as an appetizer, and here is a good thing to remember in the use of molasses feed, that it is pretty well to pay especial attention to crude fiber in molasses feed because my experience is that in general molasses feeds contain a big percentage of crude fiber stuck together with molasses.

Member: Molasses without the feed?

Dr. Robinson: It is valuable as an appetizer. It does not contain protein.

Member: Do I understand you would make no difference in the

value of a commercial feed if the other 70 per cent you speak of was weed seeds?

Dr. Robinson: I would not have you think for one instant that I meant that other 70 per cent would be weed seeds. I would not stand for that. The problem was 20 per cent protein and 10 per cent crude fiber, the other constituents would be oil or starch. As I understand the question, did it matter whether it had a high percentage of oil and low percentage of starch or low percentage of oil and high percentage of starch. I think these points may be ignored, that they will take care of themselves providing we look after the other two factors. Usually the feeds are so arranged when those other two points are taken into consideration, that the oil and starch fairly well balance each other.

The Chairman: Dr. Robinson, you say that bran is valuable as an appetizer. Wouldn't you think that good healthy cows, would not need an appetizer with good wholesome corn ensilage and clover hay?

Dr. Robinson: I do not want to be understood as saying that molasses is valuable simply as an appetizer because molasses is sugar, and sugar is a valuable food, but we cannot afford to buy sugar. We have all the sugar we want for our roughage on the farm. It is possible that the cows may not take a liking to some particular ration which we have and if that is true, if they do not eat the ration it does not matter how cheap it is, it is not going to do you any good; but if you mix it with a little molasses or a little anything else that as a food will encourage them to eat that ration, that is valuable then, but as you say ordinarily of the ration is prepared in the right way the question of palatability is taken into consideration, consequently it is not a point that is necessary to cater to.

The Chairman: We know as human beings we consume a large amount of sugar, more than any other nation in the world. We could get along without a large amount of that sugar just as well because it is an appetizer, because it is sweet. It would be absolutely necessary that we have some sugar.

Dr. Robinson: Not absolutely necessary.

The Chairman: I was thinking with the stock would it not be a good thing to have a little sugar?

Dr. Robinson: It might be a good thing to have a little sugar. For instance the succulency of your silage, the silage has sugar in it and that makes it more palatable.

The Chairman: Could a man be healthy and do as well without sugar as with sugar?

Dr. Robinson: Think of the King of the Canibal Islands. It is possible for a person to live exclusively on a protein diet. It would get tiresome. We are familiar with the dog living entirely on meat but it is not possible for a man to live entirely on something that has no protein in it. It is better for all to have a little variety.

The Chairman: If there are no other questions we will call on Mr. Hull to talk to us on The Proper Feeding and Care of the Dairy Cow.

## PROPER FEEDING AND CARE OF THE DAIRY COW.

MR. N. P. HULL, DIMONDALE.

Mr. Chairman, Ladies and Gentlemen:

It has been urged upon us several times, when we have said that dairying was profitable, that statistics show that the average cow in Michigan only produced 144 or 145 pounds of butter and surely there is not profit in that. That is true but I have asked some of those men bringing this argument "What have statistics proven in regard to the amount of feed that was given to those cows," and they did not know. I do not know exactly but as near as I have been able to learn, going over the country and taking the figures of men as nearly as they could give them, that the cost of the average ration would be somewhere in the neighborhood of \$25 or \$26 per year. Now I am getting at this in this way because I believe that the first great thing we want to learn in regard to feeding is to learn to feed a cow all the feed she ought to have to eat.

The greatest mistake that is being made in regard to keeping cows in Michigan along feeding lines, and perhaps the greatest mistake we are making along all lines, I am sure we are making the greatest mistake by feeding poor cows instead of feeding good cows properly, but surely the greatest mistake made along feeding lines is not feeding the cows all they ought to have to eat. Many men say to me "We feed our cows all they will eat." Well there is a difference between having a cow fed and just filled up, and too many men let their cows fill up and call them fed.

I will not have to talk so long because Dr. Robinson has said some of the things I can refer to and it will save me talking them over. He said it took more energy to digest oat straw than the digested stuff would furnish. A man might give his cow all the oat straw she would eat and get her filled, but she is not fed at all according to Dr. Robinson, and we have not fed that cow so as to enable her to give milk at a profit, so it may be true that they give the cows all they will eat but the cows have not been well fed. They have not been fed economical digestible nutrients to run their machinery and make all the milk a cow ought to make to be as profitable as she ought to be. So I go back to this proposition, the average man feeds \$25 or \$26 worth of feed. We use the cow as a machine. We put in a certain amount of our time to grow certain feed on our farm. We hand that feed to this cow, if you please, and expect her to take it and convert that roughage off our farm over to a product that is fit for human consumption. In that respect that cow is a machine, is he not? Let me stop and ask you gentlemen who are running machines of this sort how much does it cost to run a machine. That is, supposing you have a cow that is dry today and you are going to keep her dry for a year, you feed her until the 23rd day of March next year and still have her a 1,200 pound cow as she was when you started. How much will it

cost you to keep that cow a year, not giving any milk, but just weighing 1,200 pounds so that at the end of the year you will have the same 1,200 pound machine in your barn and nothing to show for it? What will it cost you to do that? How many men can do it for less than \$18.00? How many men can do it for less than \$20.00, charging a good price for pasture? On my farm it will cost somewhere about \$20.00. It will cost you from \$18.00 to \$20.00 will it not? Now I do not say it will but I do not see how you are going to do it for less than \$18.00 anyway. We will suppose we take \$18.00 as the cost of running that machinery. That is we will call it a maintenance ration, or that it takes \$18.00 just to keep a cow a cow, if you please, and have as much cow. You might not use \$18.00 worth of feed but you would not have as much cow at the end of the year, but it takes \$18.00 to run her machinery or as a maintenance ration.

The average cow gets \$26.00 worth of feed. Out of that \$26 worth of feed that cow gets it takes the first \$18.00 worth to run her machinery. Then there is \$8.00 worth of feed left. That machine that has cost you \$18.00 to run takes that other \$8.00 worth of feed and converts it into milk, and when the end of the year comes you say that is \$26.00 worth of feed gone. It took \$18.00 to run the machinery and then that machine only took \$8.00 worth of feed to convert into milk and you got only 144 pounds of butter and say there is not much profit in the business. I do not wonder, do you? Where is the difficulty? You have not furnished the machine enough feed to convert into milk, enough digestible nutrients. Why not, instead of \$26.00 worth of feed, why not furnish \$36.00 worth of feed at the present price of feed, and instead of having \$8.00 worth of feed to convert into milk you would have \$18.00 worth to convert into milk. If \$8.00 worth of feed makes 144 pounds of butter what would you make out of \$18.00 worth of feed? There would be only \$10.00 worth more of feed but instead of having the machine convert \$8.00 into milk it would have \$18.00 worth to convert into milk. That is where you get the profit.

I would illustrate that with another piece of machinery, a threshing machine. For how much less than \$10.00 a day can you operate a threshing machine. It will take \$10.00 a day in our county and they thresh for two cents a bushel. Suppose I was running a threshing machine and threshing 500 bushels of corn a day at two cents a bushel and it cost me \$10 a day to run my machinery, how long would I thresh to get well off? A man does not want to stop with threshing 500 bushels. That would be like giving \$18.00 worth of feed to run her machinery and at the end of the year have nothing to show for it. If our men down there thresh 750 bushels a day, how much more will it cost them to run their machinery when they thresh that amount than when they thresh 500 bushels? It may take a little more fuel, a little steadier work, but then they will have \$15 to show for it and practically \$5.00 profit. Our men down there with large machines do not stop with 750 bushels a day, they thresh a thousand bushels, and if they put a little more fuel on the fire, if they feed their machine steadily, they can thresh a thousand bushels as well as 750 bushels. How much have they? They have \$20, but how much more has it cost them to run the machinery. When they thresh 500 bushel they do not have any profit at all; when they thresh 750 bushels they have \$5.00 a day profit; if

they thresh a thousand bushels they have as much profit again as when they thresh 750 bushels.

It is exactly the same, or at least nearly the same proposition when you tend a piece of dairy machinery. No man runs any other piece of machinery and runs it on the principle that so many men run their dairy cows. They know to get the maximum profit out of any piece of machinery they must run it to its full normal capacity, but when it comes to the dairy cow they run it to one quarter capacity or one half capacity, and then condemn the business because there is no profit in it, while if they run any other piece of machinery the same way they would find no profit in it.

When I first commenced dairying I only fed \$30 worth of feed on the average, while it takes \$20 a year to keep my large cows. When I was feeding \$30 worth of feed it took \$20 worth to run the cow's machinery and I got \$40 worth of milk. I knew that was not enough. I knew men were making more money than that. I was young then and I thought if cows would make other men more money that there was no reason why they should not make me more money and I knew it was up to me to make more profit. I knew there was either one of two things, either I had a poor machine, I was feeding out \$30 and it took \$20 to run the machinery, so I knew I had a poor machine or was not handling it right. I commenced to study how to handle it. I will just say there are certain things that I concluded were necessary in handling this machine to do the best work. The first great proposition was to feed the cow regularly, that is feed the cow the same time every day, and I want to say to you there is no question about it at all, if you are going into dairying and want all there is in it, there is no business in the state of Michigan that will pay you better than dairying in case you handle it, right, but if you do not want to get all there is in it do not go into it because it means steady work and I cannot see any sense in a man going into unless he gets all there is in it. Feed the dairy cow the same time every day, then feed her a variety of foods.

A little incident came up here down in Allegan county where we were talking about ensilage. I was there some years ago and several years in succession doing institute work, and I talked silos down there I started out with the idea that a silo was a luxury and I could get along without it, if I was well off I could afford a silo. However, I noticed that the men with silos were making more money in the dairy business than I was, so I built a silo; I tried it thoroughly and satisfied myself it was right, and I was so thoroughly persuaded that it was right that I built another. I knew I was right. I told this thing down there. The last year I was there a man said "Mr. Hull, I built a silo last year." (He said it low so no one else would hear it and break my heart.) "I am getting a little more milk from my cows than ever before but the cows do not look as well as before I commenced to feed ensilage." I said "What are you feeding besides silage?" "Oh, I am not feeding anything else, just the silage." "Well," I said, "did I tell you to feed just silage alone?" "No, I do not know that you did but you said it was an awful good feed." "You like fresh pork, don't you?" "Yes," and his face brightened up at the thought of fresh pork. "When you butcher I suppose you have your wife give you fresh

pork morning, noon and night and nothing else until your pork is gone? You would not live with your wife if she did that." There was a man that used no sense in feeding his cows and then he wondered that his cows were not paying a profit. You may like fresh pork, you may like buckwheat cakes, but suppose you take any one of these foods that you like you know you cannot do a good day's work day in and day out, that you will not feel good if you eat just that food alone, nor you would not be satisfied with two foods alone, nor three, but you would want a greater variety because you will feel better, you will be able to do a better day's work with a variety of food than you would with one or two foods. That is as true with the cow as with the man.

Then a proposition in feeding is to feed palatable food. I thoroughly agree with the doctor in regard to this matter of the digestible nutrients in molasses, but I can certainly see if a man applied this molasses in the right way to his feed that it would appeal to the appetite of the cow. I believe it adds a good deal to the practical value of that feed just the same, because I am satisfied there is no one part of the ration that is as valuable to me, that will fill my pockets with profits as fast as to make the ration taste good to the cows. The chemist tells us he cannot see so much difference between silage and cured corn fodder, but we who feed silage know there is a difference and I am satisfied too that the cow likes the ensilage much better than the dried cured corn. Everyone of you know you feel better you are better able to do a good day's work if you eat what you like rather than if you eat what you do not like. I like cornmeal mush and I can eat that every day, feel good and do a good day's work, but if people insist on my eating onions in the place of corn meal mush I could not feel well. I do not know whether I would take onions or death as a last resort.

There is a proposition that we want to remember, first feed palatable food, then keep things clean around the manger of the cow so as to make things inviting for the cow. It took me four to six years to become thoroughly satisfied by experience in feeding those cows, that it was necessary to do all these things, but after I did learn to feed those cows regularly, to feed a variety of food, then feed palatable food and keep things clean around the mangers, so there would be no chance of decomposing food around the manger, the cows, instead of eating \$30.00 worth of feed, ate \$40.00 worth of feed; it took \$20 to run the cow's machinery but, instead of having \$10 to convert into milk she had \$20. I was feeding \$30 worth of feed it took \$20 worth of feed to run the cow's machinery, so it left \$10 to convert into milk, and the cow made \$40 worth of milk. That was the first year or two that I kept a record. After I learned to feed the cows regularly a variety of feed that tasted good and kept things clean, instead of eating \$30 worth of feed they ate \$40 worth; it took \$20 to run the machinery so I had \$20 worth of feed left to convert into milk, and instead of getting \$40 worth of dairy products I got \$80 worth. In \$10 worth of feed in excess of this ration would make \$40 worth of milk, why would not as much again of feed make as much again milk? When I was feeding \$30 worth of feed and getting \$40 worth of milk, I made \$10 profit; when I fed \$40 worth of feed I received \$80 worth of milk, and that was \$40 profit, four times as much. When I was studying the question of how to get my cows to eat more feed I studied that thing. How many



men are feeding cows in Oceana county and complaining about the profits, have been lying awake nights planning how to get their cows to eat more food? You show me one that has and I will show you ten that have laid awake nights planning how to get their cows to eat less. Is it not true? I said I would not try to run any other set of machinery in that way.

I would want a balanced ration too. What is a balanced ration? A balanced ration is just a common sense ration. If you were going to make barrels you would get headings, staves and hoops, would you not, because you know that you cannot make barrels without those different elements that make a barrel. If you are going to make milk don't you want to get the elements that go to make milk and get them in the right proportion to make milk, the same as to get the right proportion of headings, staves and hoops to make barrels? The chemist has studied this, the experimenter in rations has studied too, and they have learned the cow to run her machinery needs six parts of carbohydrates to one of protein. That is about the proportion she needs of these two foods to make milk and run her machinery. A balanced ration means simply to furnish those feeds in the proportion she needs. It is just as essential as to get the right proportion of hoops, staves and headings for a barrel. That is what we term a balanced ration. That is it takes the right proportion of carbohydrates and protein. There is another way to balance a ration that is as essential as this way, that is to get the proper balance between roughage and concentrates. Clover hay is a balanced ration when it comes to protein and carbohydrates but a cow cannot eat and digest enough clover hay to run her machinery and furnish nutrients for that machinery to convert into milk. She cannot eat enough to run her machinery up to its maximum, she can only eat enough to make that \$20 to run her machinery. She would give some milk because of the great maternal instinct which she possesses, but you will have less cow, she will shrink in flesh and if you get as much cow you have to furnish her with that excess of feed again, so you are practically nothing ahead.

The cow scientists tell us that the average cow ought to have about three-fifths of digestible nutrients in the feed in the form of roughage and the other two-fifths in the form of concentrates. As far as I know that is about the right proportion for the average cow. When it comes to a last analysis your particular cow or my particular cow may want the same food boiled quite a little down. Some of my cows will take five pounds of concentrates and handle their food at a larger profit than they will more; some of the other cows will take eight, nine and ten pounds of concentrates and handle them to the best advantage, so if you want the cows in your herd to do their best as individuals you have to know the normal capacity of everyone of those cows, but before you get to know the normal capacity of each cow you must understand the basic law and get some idea of the average, and the average would be about three parts of digestible nutrients in the form of roughage to two in the form of concentrates, that is for a fresh cow giving a good flow of milk, and as they go along and become stippers they get a larger percentage of feed in the form of roughage and smaller in the form of concentrates; but feed your cows all they can eat, get them to eat all they can by feeding them regularly, by feeding a variety of

food by feeding palatable food and keeping things clean; then balance the ration by giving them one part of protein to six parts of carbohydrates give three parts of digestible nutrients in the form of roughage and two parts in the form of concentrates. Give her all of this you can possibly get her to eat, for in God's name when you furnish that cow enough feed to run her machinery furnish that machinery with something to pay you, because it is the machine that gives you a profit. A man's life is of too much value to throw it away by not handling the machine right, after he has grown feed, and we want to get a profit out of it.

I have not said anything about summer feeding because Mr. Lillie gave a pretty good idea about summer feeding this morning. There are too many men in the summer that depend on pasture, who have the idea that they grow feeds to feed when the snow comes and the cow cannot get a living. You want to conclude you will grow feeds to turn them into the most possible money and you are not turning them into the most possible money when the cows run in the pasture, getting enough pasture to run her machinery but not having to furnish milk. If you have not enough pasture give her something to convert into milk so as to get some profit instead of going on running the machinery.

Mr. Lillie gave a good idea of the possibility of summer feeding so there is no use in my going over it, for he said it in a better way than I could say it and in a more logical way and you understood it. It would be a good thing to say the same things again because we have to say those things over and over before we are all thoroughly impressed, but I have another message to bring you and I am not going to say it over at all.

In the summer the cow will largely care for herself but I want to say to you if you want to get all the profit there is in dairying you want to practice winter dairying, because a good cow, thoroughly well fed and cared for, will give more pounds of milk finished in the barn than in the open, then she will give the largest amount of milk in the winter when it is worth the most, she will give the largest amount in the winter when you have the most time to milk her and then in the summer when you are busiest on the farm your cows are dry, when the flies are the worst and the pastures are the poorest they are dry, when the product is worth the least money they are dry. If you want to get the most profit out of the dairy you must practice winter dairying and to do that you must understand the principles of care of the cow. Mr. Lillie talked to you along this line about the ventilation of the cow stable. That is mighty important. I taught school ten years and it took the first five years for me to learn the first lesson about teaching school. I suppose before the five years were up that I was a dopey teacher and that I was teaching the dopiest lot of children that was in Eaton county. The teacher was dopey in a way but the children were bright enough, the only difficulty was I had all the windows shut and we went on breathing in the air and breathing it out again. It would not have been so bad if we could only have kept our own breath but this swapping around made it worse. There is no question but what this oxygen when we breathe it in to purify the blood and then breathe it out again several times, you have used the available oxygen, the blood is not pure, the brain cells become inactive

and a person becomes dozey and no matter how bright a man may be he begins to feel dull and I say it took five years to learn the first principle of teaching school, that was to open the windows and let in some of God's free air to clean up our brains and make it possible to learn our lessons. If some one could have explained to me the necessity of that it would have been worth \$200 in cold money every year to the districts which I taught, to say nothing about the time that was lost to all of those children, but they paid me so much money that they never got anything for besides wasting the time of their children, because I shut out all the pure air that cleared up one's brain and made it possible for them to learn something, made it possible to do something. We are just beginning to learn now that that old cow, if she is to run her machinery, that machinery must be in the best possible condition and we know without constitution it cannot be in the best possible condition unless she has pure air, so one of the first things to do is to see that the cow has pure air.

Then Mr. Lillie explained to you the necessity of the sunshine to kill off the germs. I will not dwell on that at all.

The next proposition, of course, is that the cow must be kept comfortable. I have asserted many times a cow should not be out doors when her owner cannot be out without getting chilled. Men have said to me that could not be true because a cow is naturally immune to the cold. A natural cow freshened in the spring, went dry in the fall, gave milk enough to support her own calf and quit and gave little or no profit; but man has taken that natural cow and practicing upon her instincts of maternity (there is no instinct that God Almighty ever placed in the beast of the human being or the animal more powerful than the maternal instinct unless the instinct of self preservation) man practiced on that all powerful instinct and persuaded that cow she was not giving enough to support her young, and we know we have practiced on her maternity so we have cows nowadays so they will freshen almost any time we want them to freshen, they will give milk eleven and one-half months in the year; that artificial cow is a valuable cow and you understand that cow cannot be allowed to go under natural conditions and remain an artificial cow making those wonderful yields. The first great principle of maternity is that the mother must be kept comfortable if she is to yield this life giving fluid, and a cow cannot be kept comfortable out of doors in cold winter weather.

I was riding across Newaygo county, one of the good, big successful men in Newaygo county was driving me, and at one place we saw a herd of cows out across the road, and this old man said to me "Well, Hull, there is that man's advertisement and here (pointing to his buildings) is the result of his business methods." You can put that down as the first essential to remember, if you see a man's cows outside running around in cold weather that that man is advertising a system of dairying that will never help to build better barns, better houses and better fences. There can be no money in it.

Keep your cows comfortable, that means keep them in a well ventilated, well lighted, warm barn. You will probably say "it is all right for you and Lillie to discuss this, to come over here and talk to us about having a well ventilated, warm, comfortable barn, because Mr. Lillie has a fine modern barn costing him quite a large sum, and Hull

has a fine barn and covered barnyard all enclosed." My cows do not go from under roof from the time they come from pasture in the fall until they are out in the spring. You say "It is all right for you people to talk that way but we cannot do it. We have not all these conveniences." Well I am going to say to you that I did not have those conveniences either until the dairy cow and myself went into partnership and earned them. Mr. Lillie did not have those things until that herd of Jersey cows over there helped him earn the money to enable him to build those things, and you will not have those things either unless you have the money if you are depending on the dairy, and there is nothing you can depend on that will help you get them any quicker, but they will not do it unless you make the conditions just so as to enable that cow to make that profit, but you can do it.

When I commenced dairying I started in a little building up against the barn, but building paper was cheap enough so I could make that building warm. Are they not cheap enough so you can make your buildings warm? Any man who can afford to own a cow can afford to have the building in which he keeps her nothing but warm because he loses a great deal, enough more than sufficient to buy the stuff to make that cow warm. He had better sell his cows if he cannot afford to get something to make that stable warm.

Today window lights are cheaper than studding and certainly when they are you can afford to put in window lights and let God's sunshine into that stable. You can let in the fresh air, can't you? If you have an ax and saw you can make a hole in either end of the barn. I believe there is no system that ventilates a barn as well as the King system. I thoroughly agree with Mr. Lillie in putting in the King system of ventilation, but ventilation is only an exchange of air from the outside in and from the inside out, and if you put a hole here and another hole there you will get ventilation, but you will have a draft there unless you cover that with something; go down to the store and get fifteen cents worth of light muslin and nail that across those holes, and you will prevent drafts but have circulation of air. You will lose some of the warmth from your stable. If it were not for the fact that you lose some warm air that system would be as good as the King system, but you are ventilating at the expense of your warmth; but if you make your stable warm and have those holes with a piece of muslin you can provide for ventilation. Make the stable light, furnish the cow comfortable quarters and then, my friends, keep her in there. I know men who have comfortable stables and then turn their cows out. Some men say the cow has to have exercise but that is nonsense. The cow's machinery was made to take food and turn it into milk, and if she uses the food for that purpose she will get enough exercise. I used to think a cow ought to go out a warm day. My cows did go out in the covered barnyard and have a chance to move around a half hour in the forenoon and a half hour in the afternoon. I was home one day last year and I said to my brother "Will not the cows go out today. It seems they ought to go in the barn yard." Well, he said, "I do not suppose it will hurt the cows but we have turned out cows enough to know they will not give as much milk. Which are we most interested in, exercise or milk?" There was a proposition right there. We could turn the cows out in the barnyard, I am sure it would not have hurt the cows

that nice day but I am sure it would have hurt the milk check because I have tried it times enough to know. I tell you, my friends, you cannot use the energy of that food to send your cows around the barnyard and make milk of it too. As Mr. Lillie said, if you turn your cows out to pasture and they have good pasture they will eat that pasture and lie down and make milk. Of course if a cow has been in the barn and you turn her out she will run around a while.

If you are interested in the profit end of the business, if you are interested in the milk business provide the dairy conditions to enable the cows in your herd to take your feed and convert it into milk at same profit. That means good generous feeding and good care.

I thank you kindly for your attention.

#### DISCUSSION.

The Chairman: We have a few minutes if you want to ask Mr. Hull any questions.

Member: How much bran do you feed cows before freshening?

Mr. Hull: It depends somewhat on the condition of the cow, time of the year, etc. We ordinarily commence and feed a couple of pounds of grain, or in lieu of that we feed sweet corn. If pastures are luxuriant and there is plenty of sweet corn, we feed them with that a little corn meal. I want those cows gain when it comes freshening time. We used to be afraid of this because of milk fever but we are no longer afraid of milk fever.

Mr. Taylor: Don't you think that the cow that is running on dry pasture is going to freshen soon should have a little more protein than would be in the sweet corn meal?

Mr. Hull: I said upon good pasture.

Mr. Taylor: Our pastures here are very poor.

Mr. Hull: Under such circumstances you should furnish some protein feed like oil meal. I would rather feed oil meal before freshening than linseed, a good deal. I would feed either gluten or oil meal. Ground peas and oats are a mighty good thing.

The Chairman: If there are no further questions, the time has come to close. I think that the members of the State Dairymen's Association, the officers can say that they feel well repaid for coming out here to this neighborhood to hold this dairy meeting. It is something we never did before, is to carry an auxiliary meeting right out into the country where there is no town at all, but I for one feel that it was the proper thing to do. We have had a nice meeting here, an interesting one. We have had some of the best discussions here we have ever had at an auxiliary meeting and I feel it has been a profitable meeting. I am glad I came and I sincerely hope that the people here are glad that we came.

Mr. Myers: I move a vote of thanks to the officers and members of the State Dairymen's Association for coming here and giving us this meeting.

Motion seconded and unanimously carried.

The Chairman: I am sure we appreciate very much this expression of the appreciation of the slight effort on our part. As I said at the beginning, we did not come out here thinking we could give you a lot

of information that you did not have, we did not have any idea that we could tell you a lot of things you did not know. We came down here to meet you on the level and to talk over problems in dairying in a way that would be of benefit to all of us, and I hope we have succeeded. I bid you all good night and dismiss you.

Meeting adjourned.

---

PROCEEDINGS OF THE  
FIFTEENTH AUXILIARY MEETING  
OF THE  
MICHIGAN DAIRYMEN'S ASSOCIATION

---

HELD IN CONNECTION WITH THE  
GRAND TRAVERSE DAIRYMEN'S ASSOCIATION'S  
NINTH ANNUAL CONVENTION

---

AT THE COURT HOUSE, TRAVERSE CITY, MARCH 25-26, 1909.

---





The fifteenth annual auxiliary meeting of the Michigan Dairymen's Associations was held in connection with the Grand Traverse Dairymen's Association at Traverse City, March 25-26, 1909.

The meeting was called to order Thursday morning, March 25, at 10:30 o'clock by William Grant, president of the Grand Traverse Dairymen's Association, and was opened with prayer by Rev. J. W. Millar, of Traverse City.

#### PRAYER.

Let us pray. Almighty God, our Heavenly Father, we realize that Thou art the source of all our blessings, Thou are the giver of every good and perfect gift. All that we have, all that we enjoy emanate from Thy goodness.

At the commencement of this convention we desire to acknowledge our thanks for all the blessings showered upon us. We ask that Thy blessings may rest upon all members of this Association, especially upon those that have come from a distant part of the country to instruct us and teach us. Let Thy blessings rest upon them, give them clearness of speech, and may Thy divine blessing rest upon this convention; and as we go upon our various ways may we go feeling that we have been instructed and blessed. Prepare us for all the duties of the hour and of the day. We ask it in Jesus name, Amen.

The Chairman: We will next listen to Judge Umlor, President of the Board of Trade, who will give us the address of welcome.

#### ADDRESS OF WELCOME.

JUDGE UMLOR, PRES. BOARD OF TRADE, TRAVERSE CITY.

Mr. Chairman, Ladies and Gentlemen:

You will pardon manuscript from the hands of a speaker as sometimes I find when speakers attempt to deliver an oration, an impromptu talk prepared beforehand but not thoroughly committed to memory, that they make a pretty bad bungle of it. Sometimes I accuse myself of that and consequently have a few thoughts copied by the typewriter this morning.

The City of Traverse bids you welcome. Its inhabitants are always

pleased to greet assemblies and particularly those which make for our social, moral or financial betterment. Embracing in a measure, as you do, these three purposes you are therefore trebly welcome.

The objects of your Association are not only for your own betterment as I have said, but for the protection and betterment of our entire commonwealth. A more sanitary dairy saves money from deaths by communicated diseases and others from expensive illness. By reducing your vocation to a scientific basis you have elevated your calling almost to the rank of a profession. Indeed the care, investigation, study and application you devote to your business calls for as high a degree of intelligent effort than is required in following profession or business lines.

Your industry has in recent years assumed stupenduous proportions. The capital invested in production of butter, cheese and condensed milk has arisen from nine million dollars twenty-five years ago to over thirty million dollars in recent years. Over 300 per cent gain and in a like period the production has increased over 600 per cent. A great change has taken place in recent years in your calling. Like many other industries from individualism you passed to the associated system. Where creameries were established which gathered the cream and under the best of conditions made butter. Later the centrifical cream separator made it possible for the farmer to take his milk to the creamery have it skimmed and take the by-product back home with him. But even this system has now in many cases been replaced by the cheap home separator which does the work as well right at your home saving time, and profits of the creamery plant.

Your progress has indeed been great.

This has not been readily realized even by your backward neighbor who will in a few years begin to wonder at his bad luck in farming. He will be surprised to learn of your large crops on small acreage while he can't sell enough off his farm to pay his debts and support his family.

Why? Chiefly because he has exhausted his soil while you have continually built up yours. You have taken time to think and have acted intelligently to your surroundings while your "back numbered" or "backwood" or "mossback" neighbor has spent his time deriding farmer associations, granges, societies of equity, etc., of which he knows nothing while others of his ilk have kept in the rut of pioneer days and dislike any form of advancement. Have you ever noticed how many of our people dislike to think? How many prefer to have others think for them? And this inertia is something that besets us everywhere. Men will find fault continually who never have given the world a positive thought.

It is with this that you must battle. Wake up your "mossback" neighbors, (I speak advisedly as there are no mossbacks here), if you can't interest him at once send him a paper. You will be surprised to hear him use as his own the arguments and ideas he finds there. If you can't interest him try it with his boys. Get your leaven to work some way. Your future importance is beyond ordinary conception and difficult to imagine from its prospective immensity.

One of the most hopeful signs of the time for agricultural success

is what I notice about greater cohesiveness among the farming interests. So many farmers are at last taking a live and intelligent interest in their welfare. This fortells much of good directly achieved and much more indirectly. Lines of commercial integrity will be more closely drawn. You will eventually treat your neighbor who fills a jar of butter, a case of fruit, a barrel of apples, a car of potatoes with inferior or damaged stock as you would a common thief. Why not? He steals the good name of your community and hinders the honest man who sells an honest article from being dealt with fairly. But enough of this. You were to be given an address of welcome and not a lecture.

Again I say to you with all my heart, "welcome."

May you come often. The latch string will always be available for your slightest pull. Traverse City wants you every year and you need only to make your wishes known to receive the best efforts of our people.

The Chairman: We certainly thank the president of the Board of Trade for his most hearty welcome. In many ways he has shown us that it is only through our united efforts that we can gain a standing. The interests in the Dairymen's Association meetings is on the increase and I am sorry it is not more so at present.

Governor Hoard of Wisconsin has done an immense amount of good in that state, and you can see the result of his interest in that state. We have never had a man in our state who has worked for our interests as he has over there. The natural surroundings there also may lean more toward dairying. Our state is occupying a backward position today because of that fact. Of course our present governor has helped a great deal in bringing the dairy interests to the front, but we believe that the day is not far distant when we, as an Association will meet here, as the guests of the Traverse City Board of Trade, as is the custom in other places, and at the close of our session that we will sit down to a banquet that is second to none in the state.

Our next topic will be "Profit from Poultry." This is given over to the Grand Traverse Northern Michigan Poultry Association. I have not the names of the speakers but undoubtedly we will all get acquainted with them as they come forward. Mr. Ebner is the first to speak on this subject.

## THE PROFIT IN POULTRY.

CHAS. J. EBNER, TRAVERSE CITY.

Mr. Chairman, Ladies and Gentlemen:

According to the last census there was in round numbers 233,600,000 hens of laying age in the United States which are valued at \$70,000,000 and the eggs they would lay would give every man, woman and child just 203 eggs apiece per annum, and again it is estimated that the total value of all fowls in the United States is \$85,800,000, which if sold and the proceeds equally divided each person would receive \$1.02. These

are only statistics and while they do not materially help us they furnish us a meager idea of the magnitude of the poultry industry in our land as we find it today. Iowa leads, Michigan is seventh I think. With these facts and figures we have an industry well worth our careful consideration and study. The first question we are asked is the subject of our discussion "The profit of poultry" so I will endeavor to answer that by relating my experience with poultry in this locality during the past 20 years which may be of benefit to some who are struggling with the question of profit in the business. I was brought up on a farm and had always heard the oft repeated accusation against that miserable nuisance about the place, the hen eating her head off many times each year, and destroying many more times her value of crops, so I never had any ambition to learn more nor thought it worth while to bother with such a worthless problem. In the course of time I had a home to supply of my own and then I began to learn for the first time the important part the hen supplied in furnishing the daily bill of fare. And how we missed those fresh eggs when none was to be had. You go to your groceryman and ask the price of eggs and he replies only 40 cents today, we ask for a dozen and are told, we haven't got them. Now this rather disgusted me not to be able to get what you want at any price. I soon learned one must do the next best thing—do without them. The following fall I decided to try a few chickens. I purchased 12 hens and a rooster of a farmer at the same time thought I would see if there was any profit in the things, so I carefully entered every item of expense in a memorandum book and also gave them credit for every egg they laid or chicken we killed at the market price. At the end of the first year I footed up my account and took an inventory of stock on hand and to my surprise I had on hand 7 old fowls and 29 youngsters and a balance of \$1.13 per head on the original number purchased. This included original purchase price paid for stock. This looked pretty good to me and told me that someone must be mistaken in their knowledge of the profits in poultry. This led me to study the question. I purchased some thoroughbred stock, began to feed and take better care of them which I found made a great difference in successfully handling poultry, especially the profit end. In these later days we are learning a great many ideas formerly held up as necessary to success are now being abandoned and more simpler methods adopted with better results and greater profits.

Our Grand Traverse region is one of the best locations in the country for the poultry business despite the fact that we have long winters and late springs, we have an unlimited market for fresh eggs the year round at prices equalling the larger cities to say nothing of the demand for live and dressed poultry at all seasons especially the demand for broilers and roasters during the resort season at top prices. This sounds good to talk about, but I imagine I hear the question asked can it be done here? I answer emphatically, *yes*. But how can it be done? Simply by going at it in a systematic business—like manner with good hard work and common sense methods, just as you do with your fruit farm or dairy farm the only difference is that you have a staple price for your eggs and poultry for every month in the year while with your farm products you have to depend upon the supply and demand.

You take the ordinary hen and she will lay between 10 and 12 dozen eggs in a year. The average price runs about 18 to 20 cents per dozen, which would mean a yield of \$1.80 to \$2.40 in the year. To raise that hen to laying age costs approximately 50 cents and it costs about 2 to 3 cents per week to keep her, or about \$1.00 to \$1.50 for the year. These prices are based on buying your feed at the feed store, which allows a profit to two—the producer and the merchant—which could be easily kept at home and added to the profits of the farm.

How to get results from your hens is the net consideration. As a rule your winter eggs are from your pullets and to have pullets early you must get your chicks hatched out early enough to mature before the cold weather sets in in the fall. I find it cost me no more to raise chicks in March and April than later and this would give you the best market for your broilers in May and June which are the culls and cockerels of your flock and leave your pullets to develop and become your early fall layers in time to get the best prices for eggs.

Again there are many questions that will suggest themselves as to breeds to raise for profit, the question of feeding, of housing all of which are of importance but our time will not permit of any lengthy discussion at this point. In regard to breeds I should choose any of the American class for general purpose as the best fowl for profit I mean by that for eggs and meat. This class includes Plymouth Rocks, Wyandottes, Rhode Island, Reds, etc. I mention these because everybody knows what the rocks are, or the Wyandottes, you must meet the popular demand when we go out for profit in any line of business. In the matter of housing the latest and most successful experiments are not the artificially heated houses of former days but the more simple dry houses with abundance of fresh air free from drafts which gives your fowls strong and vigorous constitutions free from disease and colds making them active and that means a full egg basket.

The feeding question is also an important factor in your success. First and always keep fresh pure water in easy access of your birds especially your laying hens in winter. My best results have been feeding the balanced grain ration as put out by Traverse City Milling Co., or Dickinson's and a liberal supply of a mixture of equal parts by weight of cornmeal, oatmeal, wheat bran, middlings and beef scrap which I keep constantly before them.

Another item of vital importance is cleanliness, we must keep our houses, dropping boards clean, your drinking vessels, feed troughs also must not be overlooked. All these go to make profit instead of failure out of poultry business. Much more could be said but our time will not here permit, so I will leave it for further discussion by other members present.

#### DISCUSSION.

The Chairman: We will now call on Mr. Hunter.

Mr. Hunter: I think this has been credited to me without my knowledge. I do not understand I was going to be called on here and I am not prepared.

In behalf of the Northern Michigan Poultry Association, I want to extend to the members of this Association the privilege of joining our association. We can do you some good, the same as you can do us some good, and we need your money.

Mr. Umlor: My name was mentioned as being president of the Poultry Association, but I think I am too many presidents. Mr. Hunter worked a scheme on me when we had our annual election. He got me to go out of the room to get a chair and elected me president while I was gone. Mr. Hunter has been our president and is now our secretary.

Regarding the subject under discussion, will say that I have never kept an accurate account of the profits on poultry for an entire year, but I know as far as we did keep it, it showed a profit of over \$2 per hen per year, or during the time we kept the account, probably eight months, and we never kept track of the number of eggs we ate and we did eat a good many. I know it is a profitable business and I know of no vocation, if followed intelligently and conscientiously, that will yield greater profits than we will say a ten or twenty acre farm out here, set to cherries and things of that kind, and have the hens range there. You establish thrifty orchards.

There is another thing I noticed last summer and I think in dry weather you would notice that. If you have your flocks somewhat concentrated, they will keep the soil cultivated and you will find your orchards will produce much better in a dry year than the orchards next the farm. I saw that in my own hen park last year when I did not get a drop of water there. I sprinkled the ground adjoining, but one day I had to dig there for some purpose and coming up on the high sandy portion of the hen yard I set a spade down there and, during the dryest spell we had, within three inches of the top of that ground there was an abundance of moisture, almost so wet you could run the water out of the soil, covered with that dry blanket. There is an idea I believe the fruit raisers could take advantage of.

Of course we have hens that fly. We keep the leghorns, and I do not know whether they are large enough to fly or not, but they are good workers and I know they eliminate the worms in the field to a great extent.

I think our number has been filled. Mr. Barney was put on but he is not here. Mr. Harris is a member and I would like to hear from him.

Mr. Harris: I would like to hear a little discussion as to why eggs should be not so sold by the pound instead of by the dozen. There was a time when that was the custom. Last winter I weighed some eggs at the store; there were two dozen of one kind that weighed 51 ounces, and two dozen from another flock weighed 42 ounces; nine ounces difference. It seems to me that is a pretty high percentage to give for the same rate per dozen, and there is not other way to get at it that I can see except for the producers to insist upon the eggs being sold by the pound, then a person raising eggs of large size can get a fair price for them.

The Chairman: Who has a word right along that line?

Dr. Robinson: I can say nothing along that line, but I would like to ask another question and that is, in the opinion of the poultry men, whether it is a feasible thing to require the dating of eggs, as is done in some places? I know down in Washington I went into a restaurant and asked for eggs one morning and the waiter brought in a basket of eggs and every egg was dated. He asked me to take my pick and

I selected the egg that corresponded most nearly to my idea of freshness. I have seen in a number of places eggs on sale that were dated. I would like to ask the poultry men on the feasibility of that, if there is anything to be gained?

Mr. Hunter: I think it is very feasible. Dr. Robinson got fresh eggs anyhow. I do not see any argument in that case. He received what he asked for.

Dr. Robinson: I admit there is no argument from the consumer's standpoint but I was more after the idea of the producer, whether it entailed any undue hardships that were not counteracted by the benefits received.

Mr. Hunter: It would not bother me at all to stamp all the eggs I have been getting in the last three weeks.

Mr. Weld: For instance, a gentleman makes a business of coming to Michigan to buy eggs during the summer months, puts them in storage and disposes of them to his eastern customers during the following season. It might be that producers in such cases would object to dating those eggs and certainly the dealer would.

Mr. Hull: I would like to ask if Dr. Robinson would like a stamp put on those that have been through the incubator and would not hatch?

Dr. Robinson: There are several points involved in that question, or at least two. First, there is a producer's problem as well as a consumer's. Of course the first idea a consumer has when he buys eggs is to get fresh eggs. On the other hand, there is that proposition that Mr. Weld spoke of, it works against the best interests of the producer it seems to me, because at the time of the year when those large cold storage men buy eggs cheap and place them in storage, then at the time of the year when eggs are dear those same eggs are in competition with the more expensive eggs, consequently when they could take advantage of that raise in price they are prohibited from taking the advantage of that raise in price because of the competition of eggs in storage that were bought at a cheaper rate.

The Chairman: I would like to ask Mr. Lillie's opinion in regard to this matter?

Mr. Lillie: We keep hens and they sometimes lay eggs. I believe that this question of dating eggs is an important question and I believe it is entirely practicable and feasible. Of course there has to be some changes made in the system of doing business with the farmer in order to do that. The way we sell eggs today it is hardly feasible because a man waits until he gets enough to go to town, and he wants the eggs that are seven days old to sell just as well as the fresh laid eggs, and he would find he would be handicapped in selling them.

If we had organizations in this country, the same as in Denmark, hen associations if you please, where care is taken to gather the eggs, not only by the farmer every day but to see they are put on the market in the same way, the eggs are all dated and they go on the market in a wholesale way we could make this idea of dating eggs feasible.

So far as cold storage eggs are concerned, that would not interfere with the dating of eggs, because if you were compelled to buy eggs that had been in cold storage you would prefer to buy April eggs rather than June eggs, and it would make April eggs more valuable for storage

purposes than they really are. That is why people like to put eggs into cold storage, because they keep better. When it gets hot we gather the eggs more often and take as good care as we can of them. They are affected some by the temperature and do not keep as good in cold storage as those in temperate weather. Of course April eggs would have to sell for what they would bring, and the same with the June eggs. When eggs are so old they get stale they are certainly not good food, but I think it will be a long time before we get the poultry men of this country into business organizations so that, in my opinion, it would be feasible to date eggs.

Mr. Weld: Mr. President, there is another thought. I do believe it might be feasible now and then for an individual who is conducting a business large enough to warrant it. I have in mind a party who is following that very plan, and yet each individual egg is not dated, but each individual package containing one dozen eggs is sealed and dated, and those eggs are delivered to special customers who appreciate them and are willing to pay a little extra price in order to obtain them.

The Chairman: We will now have some instrumental music.  
Duet on mandolin and guitar.

The Chairman: I do not want anyone to think that some of the men in our state have not done as much as men in the adjoining states. Such men as Mr. Lillie and Mr. Hull have done wonders in building up the dairy industry in Michigan. It occurred to me after I spoke, that some of you might think we would be better off were we in Wisconsin, but I believe Michigan is coming to the front, especially in this part of the state.

I believe this concludes the program of the poultry men unless someone else has something they wish to offer. Perhaps Mr. Hull can give us some ideas in regard to raising eggs.

## REMARKS.

MR. N. P. HULL, DIMONDALE.

Mr. President, Ladies and Gentlemen:

There was a time when I thought I had mastered the whole proposition. I made a specialty of dairying, or tried to, but I never made a specialty of the hen proposition. I was down at Tecumseh and there were a number of hen specialists there. My hens would lay in the spring but in the winter they would not lay much. The assertion was made there that if a hen was fed right she had to lay or burst. I went home and tried it, and my hens bursted; so if there is anything in that proposition, why take it.

Just in the way of something serious though, of course my work has taken me up and down the state, backwards and forwards a great deal



and while we are having better success with poultry than you might think we never have made the specialty of it that some people have; but I am very sure, from the testimony of many people up and down the state, that the hen is a mighty profitable little animal if she is just given a square deal, handled right. I have heard many times men get up and assert that their hens were running around the barnyard and sleeping where they could get a place to rest they got a good many eggs, so they built the hens a nice warm, comfortable place and then the hens stopped laying. We have learned, and a good many of those people have learned since then, that we are trying to be too good to our fowls, that is that we are building a nice warm coop but by so doing we are depriving those fowls of the things that are positively necessary they should have in order to produce profitably.

It took me five years as a teacher to learn the first principles of teaching school, and that is that we have to have fresh air in the school room. It has taken considerable time and money for egg producers to learn that it is just as essential that a hen has fresh air as it is for a school boy or school girl. It has taken considerable time for some of them to learn a hen cannot get along and do her best on one sort of food any more than a cow can, and I understand there is one other proposition, that a hen needs considerable exercise if she is to make a good many eggs. We who have followed the gospel according to the cow have learned that she does not want too much exercise.

So I have gathered this much, while I am here to admit to you that I should not take any time because I am not putting these things in practice on my farm, but it seems to me that I have heard testimony enough so I am perfectly persuaded myself that we fellows are saying a good deal about the utility of the good old cow, but if a man with the hen studies her carefully, gives her just as good feed just as good care and handles her as intelligently as we handle our dairy cows, she will make a rival to the dairy cow.

Mr. Lillie: I do not like to enter into this discussion about the farm hen or the poultry question because I was not on the program, which has been given over to the poultry association, and I do not want to appear presumptuous, but seeing we have a little time I simply want to reiterate what I have said many times, that the farmer is losing his opportunity if he does not take as much interest in hens as he does in any other kind of live stock, and I am here to say on my own farm I practice what I preach. While I believe thoroughly in the dairy cow and I try to take care of her and handle her in every way as best I can under the circumstances. As everybody knows, I am away from the farm practically all the time but still I have supervision over it, and I try to handle the dairy cow intelligently and to get the most out of her possible, but I do not give the dairy cow any more attention than I do the hen on the farm and I do not know that I am in the dairy business much more extensively than I am in the hen business. The hen business is a great business. You have to have a whole lot of hens to make a living out of them. We keep three hundred laying hens on the farm. We cannot allow them to run, as Mr. Hull suggests, in our barnyard and have the liberty of the farm, because they do too much damage. We have to confine them. My hens are confined more than

many of the poultry men in the towns confine their hens because I believe it is necessary to control the hens just as much as the other live stock on the farm, or else they will do a lot of damage. I do not want to plant a garden and have it scratched out by the hens, so we confine them and have places for them and give them intelligent care, and we make money out of them. I do not say I am satisfied because I do not suppose I ever would be satisfied because I would like to get a little more all the time, but we do well from the poultry investment on the farm, about a thousand dollars worth of hen products every year, and that is a good fair profit on the business. I think it is a greater profit on the investment than there is in any other kind of live stock but you cannot keep too many of them and have it practical.

Referring again to some of these things that have been brought up, this question of selling eggs by weight instead of by the dozen, I hardly believe it would pay to encourage that idea. It is so nice and easy to figure when eggs are sold by the dozen, and if we bought by the pound we would never have a certain number of eggs come out in a pound. There would always be a change to be made in the quantity, while by dozen we do not have to. The people who keep hens very extensively can grade their eggs and use the under sized eggs at home for their own use, so they do not have to have a mixed lot of eggs when they go to the market. If you so desire, you can grade the eggs and have two sizes, receiving a little more for the large eggs than the small ones. We have always had private customers in the city of Grand Rapids and it pays us to grade the eggs for size also for color. One woman wants white eggs and the next woman wants brown eggs. If you take a little pains you can please both women and hold their trade, and they do not care if you charge five or six cents more than the market price. If your eggs are right they do not question the price at all.

Another idea that Dr. Robinson suggested here, in regard to dating eggs, ought to be taken into consideration. We know in this talk about milk fed and corn fed and all that sort of thing the pure food departments and producers are handicapped in a way, because they find that in a large measure we have to educate the consumer. We have to educate the tastes of the consumer. To illustrate, I firmly believe that there are lots of people that have become accustomed to eating storage eggs they like them better than fresh eggs, they have acquired a taste for them. I heard President Snyder, of the Agricultural College, tell a story the other day which illustrates that very emphatically to my mind and it pleased me very much. The story runs something like this. One cold stormy day in New York a rich man returning home late at night found a couple of little newsboys huddled up in the vestibule out of the storm. He felt just right that night so he invited them in and put them in a good warm bed. In the morning he took them out into the kitchen and told the cook to give them a good breakfast. She cooked them eggs and bacon. There came the nice fresh eggs (I suppose they were dated and laid the day before). One little fellow took his knife and fork, took a piece of egg, commenced to eat it, tasted it and hesitated a little, took another piece, and finally looked over to his pal and said "Hell, these eggs have no taste, no smell."

Mr. Hull: I would like to ask Mr. Lillie why he would advise the use of under sized eggs at home, why not use the large sized ones?

Mr. Lillie: Because you want to please your customers.

Mr. Hull: The little eggs bring as much money.

Mr. Lillie: They do not bring as much. You have them all little or all big, they must be uniform in size.

Mr. Hull: I would have them all small.

Mr. Hull: Of course Mr. President, there is another idea that has been brought out here about this hen business that illustrates that people differently situated in the hen business demand different things. It has been suggested that we want plenty of winter eggs, but I would rather have all my hens lay well from now on to the first of June rather than to lay in December and January. I can make more money out of them. This is the time of year when we want a big supply of eggs. I would like to have the hens work all the year round but know they will not so I would rather have them lay a good supply of eggs for the next two months than have their big supply of eggs in December and January.

Dr. Robinson: There is another question I would like to ask. I understand that this session is devoted to hens. I would like to know whether it is the consensus of opinion among poultry men that the incubator system of hatching eggs is as reliable as hatching with the hen?

Mr. Ransom: While there is a little time to while away, I would like to say a few words, as some have read their papers and some want to talk all the time. At our place the hen business is cooperative, my wife furnishes the feed, we feed the hens and she gets all the money. What makes it more cooperative is that once in a while she gives us some eggs, she gives me two and the "kids" one.

When I was in California I noticed the farmers went into the hen business quite extensively. I have seen quite a number of acres of ground covered with hens. They seem to make a business of raising hens out there. I noticed they were all out to pasture, they keep small hen pastures, fenced in, and have some small coops. I was down in Santa Barbara, where I have a friend living. In Santa Barbara they care very little for a manufacturer of anything, all they want are rich people. My friend told me eggs were 65 cents a dozen out there. All my friends had to do was to spade ground and the chickens were fed with the worms they found in the ground. If we could do that here we could make some money in the chicken business. Do you know, he took a basket of eggs to the grocery one day and wanted to get some butter, and he received 15 cents a dozen for the eggs and paid 70 cents a pound for the butter. I laughed at him and he said the eggs had been 65 cents a dozen. I noticed that everybody in town had chickens. I did not see any incubators in California, my friend did not have any.

Mr. Lillie: I would like to ask Mr. Ebner his opinion about incubation.

Mr. Ebner: I have had no experience but I believe it exceeds the ordinary hen for incubation. I think where a person will take care of the incubator, that is the average run of incubators, and operate them as they should, there is no reason why with fertile eggs they cannot get a better percentage than they can by hatching with the hen.

Mr. Lillie: Are the chickens as strong?

Mr. Ebner: I think they are, if you do not overheat your incubator. That is where the trouble is with weak chickens. If you fairly roast your chickens at any time during incubation, or let them get too cold, the chickens will be injured.

Dr. Robinson: Of course they require more care with the incubator.

Mr. Ebner: I do not think so. If you keep the incubator heated properly you will find the chickens will come out all right.

Dr. Robinson: It is necessary to turn the eggs?

Mr. Ebner: Of late people are abandoning that, although I believe some yet do that.

Mr. Lillie: Do you turn your eggs?

Mr. Ebner: I have up to this year.

Mr. Ranson: Do you get as large a percentage of chickens from the incubator as from hens?

Mr. Ebner: Just as large, if not larger, considering the breakage, etc. I might say in behalf of the poultry association, that we have had eight shows here and the poultry industry has grown remarkably. If you go down to the express office from this time on you will be surprised at the amount of eggs that are sent out for. We have in this region quite a number of good reliable breeders that have good stock and I feel that it is nothing more than justice that we should advocate buying our eggs at home, because we have good stock here accumulating, and we know what we are getting. That has been my experience. I have bought eggs all over this country. I know that we have an expert poultry man, that is Mr. Knight. That man sent off last year and paid \$30 for two setters and he has the best in this county, selling them for \$2 a setter. There are others here who have Plymouth Rocks, some have Wyandottes. You cannot get any better stock than Mr. Harris has, and there are others, and I think you would get better results from buying your eggs in this region. I know there are a great many men all through the state selling eggs and I know it is nonsense to send to New York for eggs because in transportation you do not get a very big percentage.

Mr. Raven: I would like to answer Dr. Robinson's questions as far as incubator chickens are concerned. We have raised poultry on the farm for a good many years. Three years ago we made three hatches, the first season 248 in the incubator and we had over 200 chickens. Out of this hatch we lost one chicken, with the exception that it came a very cold night and the lamp in the incubator went out and we lost nineteen chickens by being chilled.

The incubator chickens have a square start in life. I would rather take care of one brood of incubator chickens than a half dozen setting hens or their chickens. The incubator chickens will stay where you put them because they have been used to it. They will always look to you for their food and drink. I am not the chicken man on my farm but I have noticed on our place when we want to move the incubator chickens and place them anywhere they stay there content, but the chickens that hatch from the old hen will not stay where you want them. There is nothing that will keep the lice away as well as the incubator. If you have an incubator thoroughly packed so it will hold the temperature and then thoroughly clean it after each hatch, I think you will have no trouble with a good hatch. I remember once my wife thought

she was going to lose a hatch in the incubator. The temperature had dropped down to 90, but she went at it and got it warmed to 102½ or 103 degrees, and she had a very good hatch in it. I find it does not do as much injury to the chickens to have the incubator get cold as to have it overheated. In natural incubation the eggs will get cold when the hen is away from the nest. We find we get very good chickens by keeping the temperature at 103, but if it does go below that do not get discouraged. That is our experience for three years on the farm. We take the incubator chicken every time and raise a larger percentage of them because they have a good start. We turn the eggs in our incubator.

Mr. Lillie: Did you ever know of anybody that did not turn the eggs?

Mr. Raven: I never heard of it until this morning but I am not a chicken man.

Mr. Lillie: I would like to know if there is any poultry man who ever had eggs in the incubator without turning them?

Mr. Ebner: We turn them around but we do not turn them over. We do roll them over.

Mr. Lillie: There is another idea, that they do not need to be mixed at all.

Mr. Ebner: I have never had any experience with that.

Mr. Raven: President Halpin at the college has a model of a hen's nest and a hen has done her setting. She has turned the eggs over every day and sometimes three times. He got a perfect hatch, fifteen chickens out of those fifteen eggs.

Mr. Lillie: Do you think the old hen knows all about it?

Mr. Ebner: There was an idea that the eggs should be taken out and turned end for end.

Mr. Lillie: They have done away with that idea and roll them over with the end.

Dr. Robinson: I know nothing about it, but I have heard during the last year the question of turning the eggs disputed, that there is absolutely no necessity of turning the eggs, and I simply asked for information. I do not remember the exact reason but the question of the hen actually turning those eggs was absolutely disputed, she may have turned them over but at other times she shifted them one side to the other.

Mr. Lillie: I do not know much about this although I have heard the idea that has been suggested here, that it is not necessary to turn the eggs every day. When I first began using an incubator I did not make any distinction but simply turned them over by hand. Somebody told me you should mark the egg and the next setting we did and we found that we did not turn them all over, because we would think we were rolling them around and the mark would stay up and I have reason to think some of those eggs did not turn over but we had a better hatch than when we took pains to have every one rolled over.

Mr. Raven: Don't you think some other factor entered into that?

Mr. Lillie: No the conditions were just the same. If you get your thermostat regulated once and trim your wick every morning and fill your lamp, it does not need much more attention.

Dr. Robinson: What is the object of turning the eggs?

Mr. Lillie: I do not know. Mr. Raven says it is desirable because

the hen does and she knows. Now does the hen know? I know my experience with hens is that an old setting hen does not know any more than she ought to. She does not know enough to take care of her brood after she has them.

Mr. Ransom: I suppose the setting hens are like people, some are more intelligent than others.

The Chairman: I believe our time is up and we will try to get together at 1 o'clock this afternoon instead of 1:30. We will now stand adjourned.

---

### THURSDAY AFTERNOON SESSION.

Meeting called to order at 2 o'clock with President Grant in the chair, and opened with music, a duet on mandolin and guitar by Mrs. Lena Brown and Miss Nora Barnes.

The Chairman: Mr. Weld, who was on to give us the result of the scoring, has to leave us tomorrow morning so we will call on him at this time.

### RESULT OF SCORING.

PROF. IVAN C. WELD, WASHINGTON, D. C.

Mr. President, Ladies and Gentlemen:

I thought you might be interested in knowing some of the things in connection with the examination of milk, so I have arranged to take a few minutes today at the beginning of this session to explain some of the points in the examination of the samples.

Of course you realize that, so far as the consumer is concerned at least, all milk looks alike, one bottle looks very much like every other bottle, and it is only when we begin to study the details of the milk and examine it from several different standpoints that we begin to become acquainted with it and know something of its composition and something of the possible effect it will have when consumed as food. I have a little of the laboratory equipment here, with which I shall try to show you some of the points which have been brought out in connection with the scoring of milk.

I feel that you people who are interested in that matter ought to be congratulated on the fact that you have a live dairymen's association, an organization which is trying to study some of those more difficult problems, learn what the difficulties in the improvement of the milk supply are. I do not know whether the consumers have come together to study the improvement of the milk supply but it is evident

that the dairymen are going to take the initiative and that the dairymen are in this respect a little ahead of the consumer.

We realize in an examination of milk, in the milk and cream contests that there are several important factors to be considered. The scoring of milk and cream or the study of milk and cream from the standpoint of its composition and usefulness as food. 100 points are given for perfect milk and of those 100 points 40 are given to the item of flavor. We realize that no matter how perfect the milk may be in other respects no one cares to consume it if the flavor is not good. I have seen some of the cleanest milk, produced under the most sanitary conditions, which was absolutely worthless simply because the cows had consumed food which imparted to that milk a flavor which rendered it unfit for food, so we realize that we must not only have a clean product but a product that tastes good.

Twenty-five points are given composition. Formerly, or at least fifteen or twenty years ago, we did not hear very much about milk except as to its composition. Take for instance the annual report issued by the Board of Health of the City of Boston, a report of about fifty pages. About forty-seven or forty-eight of those pages are given up to the discussion of the composition of milk, the amount of fats and solids it contained; two or three pages devoted to a brief, superficial discussion of the cleanliness of milk. The report issued this last year contains forty-seven or forty-eight pages devoted to cleanliness of milk and the fitness of that milk as food, and a brief mention, two or so pages are given to its composition. This shows the change that has come about and I know that you realize, as well as I, that it is time that we do consider the cleanliness and healthfulness of our food products as well as the composition.

The number of bacteria is given 20 points out of a possible 100. We realize that milk containing a very high number of bacteria is undesirable and we believe, and are willing to base it upon the work of various officials throughout the country, that milk containing over five hundred thousand bacteria per cubic centimeter should not be awarded a single point on the score card. We believe a market milk containing as low as ten thousand bacteria may be considered a perfect market milk, and therefore the graduation between ten thousand and five hundred thousand is taken as a basis to score milk as regards bacteria.

The acidity of milk is given five points. That is not a question of any great account and yet it is a question which is not being ignored.

Appearance of package and contents are given ten points out of a possible 100. That is because we all realize that a package should at once be attractive to the eye of the consumer and that it should be handled in good form. The appearance of the package and contents is given ten points.

Now then we come to the question of examining the milk itself. In testing for flavor and odor, of course we use the organs of taste and smell. The odors are noted and the milk carefully noted, and we employ such facilities as may be available for detecting the presence of any foreign flavors or odors. I know you would be surprised, if you never tried it, if you were to take fifteen or twenty samples of milk, tasting first one and then the other. I know you would be surprised at the

difference in taste of that milk. I was greatly surprised the first time I tried it and I have hardly ever found an exhibit that did not vary a great deal in that particular, and the odor is more or less agreeable or disagreeable according to conditions, and wherever a perfect milk is found, if ever found, it is given a full score of 40 points.

As regards the composition, the fats are determined by the well known Babcock test. It is a very simple proposition, with which you are all familiar. As to the total solids, or solids not fat, the determination is made by the use of the Babcock test for fats and a special hydrometer, which is an instrument that registers the specific gravity of the milk. You realize that the more solid matter in the milk, the denser it will be, the greater will be its specific gravity, therefore an instrument of known weight will float deeper or lighter in that milk according to the density of the milk. This instrument that I have here is the one that is used for the purpose. One of our men devised this instrument, which is graduated to one-tenth of one degree so with this instrument we are able to read very closely the specific gravity, and knowing the specific gravity of the milk we use a round glass cylinder which is quite high, perhaps a little lower than the top of this bottle, the milk is poured in and the point where the milk comes in contact with this stem shows the specific gravity of the milk. Knowing the specific gravity and percent of fat, we can determine the composition very easily.

As regards bacteria, I will try to show you just how the first steps are taken. We have had to start with a quantity of milk. The cubic centimeter is the unit which is usually taken. We hear about so many bacteria per cubic centimeter, which is approximately twenty drops but we do not measure it by drops because the size of a drop depends on from where it drops, so we have constructed special pipettes, a little glass tube, very small inside, and that glass tube is divided into ten parts, each part representing one-tenth of a cubic centimeter. The ten parts together represent the cubic centimeter or the capacity of that tube between those two points, about twenty drops. We are going to determine the number of bacteria per cubic centimeter in a given bottle of milk. After shaking the milk thoroughly and vigorously, so as to thoroughly mix every particle of cream in the milk so as to get a thoroughly good mixture. We make a hole in the top of the package and through that opening, without bringing the milk in contact with the air at all, we push this pipette into the center of the package and then draw enough milk into this pipette so as to measure the proper amount. Now we have a pipette full and we have prepared in advance a little bottle of water. That water contains 99 cubic centimeters and I have one cubic centimeter of milk. That water has been made absolutely sterile; it has been placed in a tight chamber under steam pressure and every germ has been destroyed. In those 99 cubic centimeter of water we introduce one cubic centimeter of milk. We know we have a dilution of one part of milk and ninety-nine of water, or one part in one hundred as ordinarily determined. The next step is to thoroughly shake that bottle so that little germ present in the milk will become separate from every other germ, and we have a complete mixture of the milk and water. After that has been accomplished we have ready for use a little dish known as a petard dish, because that happened to



be the name of the man who invented it. Those little dishes have been cleaned and prepared and sterilized under pressure, so there is not a single germ inside. Then we take a fresh pipette, one that has not been used, one that is perfectly sterilized, and from that mixture of milk and water we draw a sample. We usually make two plates because we do not know whether we are going to find a few bacteria or many in that milk. Into the first petard dish we put one cubic centimeter of mixture, just lifting the cover enough so it can pass in. Then we take another fresh package and into the second petard dish place one-tenth of the cubic centimeter. Now we have two dilutions. If we find a good many bacteria in that milk, the one dilution will tell us the number. If there are only a few the other dilution will tell it. In other words, we have in one particular a sample of milk representing one part of 100, and the other one part of one thousand. Now we have also prepared the culture medea, made up of a gelatin substance, a little lactose, a little milk sugar, and you know that bacteria like to feed on milk sugar pretty well. We put them in a liquid condition and pour the contents of this tube into a petard dish, and that dish given a gentle motion so that part of milk and culture medea will be mixed, and then the dish is set aside on a level surface and in two or three minutes time the culture medea has hardened and every little germ floating around in that liquid is now a prisoner. Every little germ is held in a definite place, wherever it may be, in that solid matter. They can no longer float about. That gelatin has become solid and every germ is held right there.

The next step is to close these petard dishes so these germs will grow as rapidly as possible. Perhaps an incubator is arranged. An incubator for growing bacteria is not very different from that used for hatching chickens, except in the way the principle is applied. For hatching chickens you want a temperature of 102 or 103 perhaps. For growing bacteria we want a temperature of 90 or 95 degrees, and this apparatus is so constructed as to give us a temperature accordingly. After two or three days each one of those germs which have been caught and held a prisoner has grown and developed sufficiently to form a little colony. That colony can be clearly seen and the number of colonies in a given point can be readily counted.

I do not expect you will take this apparatus and make counts from the description I have given you, but I want to give you an idea as to how the work is done, so that when you submit a sample of milk and cream for competition you will have some idea of what will happen in the examination of the samples.

You will notice, as you look these plates over, that in some of the dishes the spots are very small and quite numerous. You can see it would be a very difficult thing indeed to count each one of these spots unless you have some special aid for doing that work. Where we have a great many to count, you can imagine it would be very tiresome so someone was good enough to devise a little piece of apparatus, a little glass rod into areas of equal dimensions, as you can see here, and in counting these colonies of bacteria if you place this glass where the light is very good, and place the petard dish on the surface so you can look beyond it, that defines the areas so you can count the number

of bacteria in a given area, and that is of great assistance. Then another thing we have is a little automatic counter. We press this little stem and we have registered the number of bacteria in a given spot; knowing the number of spots in the dish, all that is necessary is to make the necessary multiplication and we are enabled to know whether in one bottle of milk there is one thousand bacteria per cubic centimeter or whether there are one hundred thousand.

Now if there are any questions you would like to ask in regard to that I would be glad to answer if I can before we pass on.

The next point usually considered is the acidity of the milk. We all know there is a little acid present in milk even when it is drawn, but if the amount of acidity increases to any extent it is due almost invariably to the development of bacteria in milk feeding on milk sugar and those bacteria produce lactic acid. Now it is especially desirable in some lines of dairy work to know the amount of acidity in the milk and that is determined by measuring the samples of milk into different quantities and adding to that a certain amount of alkali of known strength, the definite amount of alkali neutralizing the amount of acid. In order to make that more clear I will make an exceedingly rough test of one of these samples, that is I will illustrate the principle although I will not be able to make a complete test. We desire to know how much acid there is in it. To the milk we add two or three drops of a chemical which is colorless in an acid solution. You seen in adding that no change of color has taken place. To that milk we add a little alkali solution. We will now measure this, but you will notice where the solution comes in contact with the milk it is changed to a pink color and as we let it run in in considerable quantities the entire milk is changed to a reddish color. That is the principle of the test but in making an actual test the amounts of milk and acid are very carefully measured and instead of turning the milk to a color like that you see the action of the alkali is stopped when the milk reaches a pink condition, just as soon as any change of color is noted. That tells you roughly the principal idea in making the test. That is all I will attempt to illustrate. It shows you that we can measure the amount of acid by the use of alkali.

In considering each one of these steps you see we have been studying the sum total of milk. We have studied it from the standpoint of flavor, from the standpoint of composition, bacteria, acidity and appearance of package. Just a word in regard to that. Usually the first thing we look for in connection with a sample of milk is the general appearance of the package. There is probably no better package under the sun for the retail trade than the plain glass bottle. I know of nothing which would perhaps be of greater assistance to the man who desired to go a little further than to add a little boiling hot paraffine to the top of this bottle, thereby sealing the bottle, making the package air tight and preventing any further contamination of the milk. There is another thing which is exceedingly useful in guarding the milk further. If you have a little piece of parchment butter paper, either a circle or square, and desire to protect your milk more completely than can be done by this cap, simply put that paper over the top of your bottle, bring it down tightly like that and put a rubber band over it. A little piece of paper like that protects the top of your

bottle from dust and mud and other substances which come in contact with it and which may contaminate the milk. It is a very simple thing to do and a very useful thing when it comes to the question of effectually protecting your milk. I speak of those things because I anticipate that sooner or later some of the people who send milk here for examination will be sending samples to other places and I want you to profit by this experience, so I will say if you ever contemplate sending samples to the state exhibit or national exhibits, after you have put your milk in the bottle and put your cap on in position, take a little boiling paraffine and drop it on top and when that paraffine hardens you will find your bottle sealed, and over the top of that place a piece of paper and you will have very carefully protected your milk so far as package can do it. Then put your milk either in a box or case and cover it completely with crushed ice, I do not care where you are shipping your exhibit. It looks unreasonable at first at this time of year to suggest using ice, but if you should take the temperature of some of the express offices and some of the trains and places where this sample of milk may have to wait before it gets to the laboratory, you would find temperatures higher than they are at the farm where the milk is produced, so in any event cover your bottles with crushed ice and put on enough so there will be no change in temperature until the milk reaches the laboratory for examination.

This is a very rough description, I am well aware, of the methods used in examining the milk and cream samples and milk and cream contents, but it may serve to give you a little light at least in regard to the methods employed and when you have your exhibit here another year I trust that instead of six or seven samples you will have at least twenty-five or thirty. Certainly every man producing milk for the local market should be interested in having his product examined and scored, and unless conditions are different here than they have been any other place I have visited, such a proceeding will be quite likely to shed a little light on the subject and make the production and distribution of milk a little pleasanter. In other words, the more we study the details of the thing the more we become interested in it, the better work we are going to do; and so, instead of just producing milk and shipping it by the hundred or the bottle to the local market, we are going to study the details of flavor, composition, etc., we will study those points which may affect or add to the number of bacteria in the milk. You will guard against high acidity and inferior composition and you will also guard against another thing and a thing which is very important, and that is the question of sediment in the bottom of the bottle. The first thing we ever do in making an examination of a sample of milk, before we disturb the contents of the bottle, is to hold that bottle carefully above our head in a good strong light, then we usually use a lense or reading glass and if there is any foreign matter in the bottom of that bottle we are pretty sure to find it. It is a little bit strange, but no producer of milk is inclined to believe that there can be such a thing as sediment in his own milk. I have seen a great many producers who were considerably surprised when it was brought to their attention, and there is one thing I would suggest to every producer if you have a bottle like this, or any kind of bottle, just

watch your own product for a few days; in the morning when you strain your milk just put a little of it into a glass bottle and set it aside and when you come in to dinner take a look at the bottom of that bottle and see whether there is any sediment in your milk. That is a thing which you as producers have to guard against because the consumers of milk are not only looking for the cream line today but are looking for the milk that is free from sediment and you cannot be too careful in guarding against it.

I am glad to say that in the samples of milk examined here there was no considerable amount of sediment in any sample, although I did not find any sample that was absolutely free from it. There was at least a little in every bottle and I know that you did not know it was there, would not believe it would be possible, but nevertheless it is there and if there is a point that we must study it is to learn how it gets in there. You must follow that up on your own farms in your own way, you must find how that comes in there and then overcome that difficulty, planning by some means in some way to avoid it.

In this contest there were six samples of milk. The highest score was  $95\frac{1}{2}$ , the lowest score 90. In the milk winning first prize we found four one per cent butter fat, 8.69 solids not fat, bacteria 5,000; flavor received 36 out of 40 points; score for composition was 25 out of 25, bacteria 20 out of 20 points, score for acidity five out of five points, score on package  $9\frac{1}{2}$  out of 10, total score  $95\frac{1}{2}$  points; a very good sample of milk. The name of the producer is George Satchleban.

The next lowest score is  $94\frac{1}{2}$ , and two samples of milk received this score. They scored very much alike in every respect and as a result the second prize will be divided. The winners of the second prize are Wm. Grant and E. Bragdon.

The third score was received by E. L. Ransom and the fourth by John Smith.

This, then, is the result of your milk contest. I only regret that there were not thirty or forty samples, or at least one sample from every dairyman in the community, and I trust another year when you get together in your annual meeting that you will be represented not only in person but by sample of your product as well.

I thank you for your kindness.

#### DISCUSSION.

The Chairman: I think these tests do us a world of good. I do not believe a party brings in milk to a contest but he honestly believes he has the best and cleanest milk in town but you see there is dirt in every bit of it. There are twelve or fourteen different men producing milk for this city and there should be at least twelve or fourteen samples of milk here, and why there is not I do not know. It is simply, I believe, because the parties are afraid to have their samples analyzed, afraid to know whether their milk is right, so I am going to ask our friend Whitney if next year he will not get a sample down here. By the way, I was over to his place the other day and I was surprised at the care they take of their cows and the way they do things. They have a great deal more care than we farmers realize.

Mr. Lillie: In Mr. Weld's talk he did not say much about the bac-

teria content. As I understand, he gave us the bacteria in the high scoring milk. I would like to ask what the highest number of bacteria in any sample was.

Mr. Weld: I am glad you brought that up because it was one of the things I should have done and did not do. The lowest number of bacteria found in any sample of milk in this exhibit was 4,500. That is an exceedingly low number. The highest number of bacteria found in any sample of milk was 17,000. Seventeen thousand is not an exceedingly high number, and therefore it is a very commendable showing so far as the number of bacteria are concerned. The lowest number of bacteria was 4,500, the next 5,000, next higher 7,300, next 7,700, next 9,000 and then it jumps up to 17,000. Of course there were only six samples submitted.

The Chairman: In regard to these samples, they were supposed to be just exactly the milk that was delivered on the street and my idea is that another year a committee be appointed from the dairyman's association to take a sample from the milk on the street and not let the man that handles the milk have anything to do with bringing the sample in. I believe that is a fair way. The idea is to take the market milk and have no extra precautions taken with the bottle. I believe that is the only fair test to make. Whether that has been the case here or not I cannot say, except in my own case.

If there is nothing further on this subject, I believe we will take up the next topic, Improvement of Michigan Dairy Stock by Mr. Raven of Brooklyn.

## IMPROVEMENT OF MICHIGAN LIVE STOCK.

MR. W. F. RAVEN, BROOKLYN.

Mr. Chairman, Ladies and Gentlemen:

The subject I am about to talk on is one, I believe, of great importance to the dairymen of Michigan and to the farmers of Michigan. I believe Michigan is bound to become a dairy state and the forces that are at work in Michigan today are going to make it one of the banner dairy states of the Union. The forces which are at work are the farmer on the farm, the Dairy and Food department, the test associations which are under the supervision of the Dairy and Food Department, the Farm Department of the Agricultural College, and working together I believe those forces will make Michigan one of the banner dairy states of the Union.

On the farms of this state there are young men going into the dairy business and going into it for the profit there is in it, and they constitute a force that we have to appreciate and acknowledge is making Michigan one of the live states in the Union along dairy lines. The income from the dairy or from live stock is an added income to every farmer in Michigan. It has been found in the older portions of the state that we cannot have successful agriculture without live stock

husbandry. Live stock must be the basis of successful agriculture, I care not whether you grow fruit or special crops; I care not what you grow, you must make live stock the basis of your farm and it has been found that with the added increase in the cost of labor and the price of feed that we have to grow better stock in Michigan in order to get better results.

Some years ago the legislature appropriated \$20,000 for the purpose of live stock improvement in this state. This money was turned over to the State Board and over to the Farm Department of the Agricultural College for experimental work. The college purchased twenty common cows for experimental purposes. They divide those cows into two groups, one a dairy group and the other a beef group. They bred them to two sires of the dairy breed and beef breed and to an equal number of scrub sires. They did that for four years so every cow in the experiment was bred to each of the sires.

In the beef breed they got results very quickly. When the calves were one year old from the beef herd, (five cows having been bred to a Short-horn sire, five to a Hereford sire, five to an Ayershire sire and five to a scrub sire) they invited the breeders of the state to put a value on the calves. They took the twenty calves into the ring and put a special value on each of them. If the men did not agree upon the value of each calf, they added up the separate values and divided by the number of men appraising the calf. It was found that the best calf that year weighed 771 pounds and they all agreed his value was \$4.50 a hundred. It was found that the poorest calf in the twenty weighed 600 pounds. They were not all agreed on its value but the average value placed on the calf was \$2.48 a hundred pounds, making a difference of almost \$17 in the two calves. After the value was placed on those two calves they put in the ring all the dams and sires of the calves and it was found the best calf was from the Hereford sire and the poorest from the scrub sire. Then they took the best calf from the scrub sire and the poorest from any of the registered sires and found there was a difference of \$10 in their value.

I am telling you this for the purpose of showing you what they were attempting to find out at the college. They wanted to find the exact difference in breeding scrub sires and in breeding registered sires.

Along dairy lines the work has been very much slower. Prof. Anderson told me a few days ago that they just got their data of those cows bred to the dairy sires in the dairy group. If I remember correctly, I did not make a memorandum of it, he said from \$11 to \$23 had the three year olds produced more than their dams had produced, but it would take a series of years before the data was completed so they would know exactly what the difference would be.

A year ago last December, when this experiment on the forty cows was finished, they wanted to take this experiment to the farm and see if the farmer could get the same results that were obtained at the college, breeding their cows to registered sires. The State Board of Agriculture decided to appoint a field agent to go among the farmers and see if he could get them to breed their cows to registered sires, especially those breeding to scrubs and grades. They had several objects in doing this. In the first place, they wanted to get whole communities breeding one kind of cattle because when a whole community

is raising one kind of product, regardless of what that product may be, they can receive a better price for their product than can people that are raising different products in the same community. In the section of this state where the largest market for potatoes is, potatoes are always higher than in any other place in the state because buyers can go there and get potatoes in any quantity they desire. The same is true of cattle. There is no place in the state today where Holsteins will bring better money than at Howell because everyone in the vicinity of Howell breeds Holsteins. This is true of Jerseys in other parts of the state.

The object of this work was to get communities to breed one kind of cattle and get the small farmers to breed their cows to registered sires. The census of Michigan showed that nearly 90 per cent of good cattle grown in Michigan were grown on farms of two to ten cows, and about 85 per cent of those farmers were breeding to scrub, grade and cross bred sires because they said they could not afford to use a registered sire. They only had a small number of cows and I am sorry to say a great many of them did not care about raising the calves, they simply bred to anything they could get so their cows would freshen. That is the condition we found in a great many places in Michigan.

The State Board decided, as I said, to appoint a field agent to get the farmer to devise some scheme whereby he could use a registered sire. I was appointed for the purpose. I have visited something like a thousand farms in Michigan during the last year and have endeavored to get the farmers to change their conditions, to get better stock in Michigan by a system of upgrading. I found a great many men in this state that when I asked them to improve their cattle by upgrading would say they could not afford to do it, could not afford to go in to pure bred stock. I can say they cannot afford it because were one-half the men in Michigan to attempt to change their conditions by taking the grade stock they have on their farms and changing over to pure bred, they could not buy them because there are not enough to go around. Less than 1 per cent of the cattle of the United States are pure bred and Michigan has perhaps not as many as the other states. I have been in sections of this state where I have driven eight and nine days and found not one pure bred animal in the entire district.

I was asked to devise a scheme whereby the farmers could have the use of registered sires, and the following plan is what I finally succeeded in getting the farmers to adopt. I would go into a community and get the owners of 120 cows to agree on a breed of cattle. Those are necessarily small farmers handling from two to ten cows and it takes quite a number of farmers to own that number of cows. In fact in some cases it would mean 30 men would own 120 cows. When they do agree on a breed of cattle I organize them into an association and this association is incorporated under the state laws. The association will purchase three registered sires of the breed they select. They will place each of those sires in a group of forty cows, and those forty cows ought to be located near each other so a man would not have to drive his cow for service more than two miles. We intend to locate those sires in each group centrally if we can. When those sires have been in each group of forty cows for two years, instead of buying new sires

they are exchanged to another group; at the end of four years there is another exchange made.' There are several things gained by doing this. In the first place the farmers do not have to purchase new sires and if you get a good sire you keep him until you know his value, and if he is a good sire when you are through with him you can get another to take his place and save him to breed to other cows in the association and thereby get quick results in the improvement of live stock.

I have organized fourteen of these associations in the state and some of the associations have taken as many as eighteen sires. One at Hudson has already purchased eighteen sires, a good many have taken nine and some only three. The largest association in the state is at Blissfield. I was there two weeks ago and I found that all the cows in the association have dropped their calves, and a more enthusiastic bunch of farmers I never saw. They were pleased with the cattle and nearly everyone had doubled their herds by purchase. I believe this plan is going to do much good for the improvement of cattle in Michigan and by it the small farmers can get the use of a registered sire very cheaply.

As to details of organization, each man joining the association, regardless of whether he has two or ten cows, pays the same amount of money towards the purchase price of the sire. Now we have two kinds of associations. One is what we call the "Stock County Association," or the one I have just explained. The other is an association in a community where men have from eighteen to forty cows and in those communities, like Hudson and Fremont, each man pledges himself to breed his cows to whatever breed is selected by the association. In Hudson it is the Holstein, in Fremont the Guernsey. Each member of the association is pledged to use the Holstein, the Guernsey, or whatever breed is decided upon by the association. Those companies are incorporated but are not stock companies. They also have an association for exchange of sires among themselves. A great many associations have had each member purchase a pure bred female and have them come at the same time as their sires, and those men have made arrangements so it will be a good many years before they have to purchase sires outside of their own association because where there were Guernsey cattle Governor Hoard advised which family to buy so they could breed from one family to another and have no inbreeding, and improve all the time. Governor Hoard took a lively interest in the association at Blissfield.

I am asked a great many times how the breeds stand. To day the Holstein sires are a few ahead, three weeks ago the Jerseys were ahead and last December the Guernseys were ahead, depending on the community in which we work. I am asked a number of times which is the best breed. I do not know; I have no choice in the matter as far as my work is concerned. Personally I have. I say to the farmer and to the association "Select the breed of cows you want for the work you want them to do and stick to it and you will come out a winner." What we want in these associations is to stop mixing the breeds. There has been much harm done in this state by breeding to dairy sires one year and to beef sires another year, then crossing beef breeds with dairy breeds and dairy breeds with beef breeds, and so on, making the worst kind of scrub animal.



All over this state there is a growing sentiment in favor of better cattle and it is growing very rapidly. Only last week I received twenty-two requests from different places in this state to come and organize breeders associations. I say to you it is a work that we as farmers ought to take hold of, not because I am in the work but because it is for your profit and for the betterment of the state of Michigan; it is for the betterment of the dairy interests, for the betterment of the beef interests and for the live stock interests all over this state. I am not organizing cattle associations alone, but hog associations as well. There will be men in a few months that will take hold of the sheep end of live stock, and here is a proposition along the same lines. Just as soon as the work can be planned and men selected, that branch of the work is going to be carried on all over Michigan.

I say to you that if there is anybody in this community that believes such an association would be for the betterment of the livestock interests, he can get my aid and assistance at any time to organize, he can get my help at any time if he can get a full organization. Four or five men get together, purchase a sire for use in their own community, and when one of those small organizations is formed others will follow. A smaller gathering like the one I have suggested of four or five men I would not consider as an association; those I have organized were full associations, incorporated under the state laws. I have also several small groups where four or five men banded together and bought a sire. Sometimes they would not agree with the regular association in their community, wanting a different breed and three or four men will get the sires of the other breed.

I have with me some circulars or bulletins in regard to these breeders' associations and I will be glad to give a circular to anyone interested in this idea of live stock improvement, which is going to be taken up all over this state, and the sooner you form an association the cheaper will you buy your sires. I have place within the year something like 120 sires. They will each breed forty cows next year that the previous year were bred to scrub, grade and cross grade sires. They are going to have some better sires in Michigan.

## DISCUSSION.

C. L. WHITNEY, STEWARD, NORTHERN MICHIGAN ASYLUM.

Mr. President, Ladies and Gentlemen:

I was pleased yesterday to have a visit from our friend who has just addressed you. Knowing that I was to follow him today, I asked him if he did not have a copy of the speech he was going to deliver. I thought I would like to find the weak points in it but I see he is pretty well grounded.

There is an old proverb "In union there is strength," in union of two or three or proportionately more there is power, and when two men join hands and agree to work together in the development of live

stock, as has been intimated by Mr. Raven today, they have an advantage they cannot gain in any other way, not only in the cheapness of purchase, but there is a constant effort among themselves to do a little better than their neighbors.

Then there is another principle that comes up there that I noticed in 1852. We were breeding sheep in the eastern part of the state and we had some great sheep; some of the neighbors had some they used to drive in the barn in the month of June, catch hold of the wool and say "shoo" and they were sheared. There was not much of the wool left except a little on the back, but they started purchasing the Ramdalet strain of the Mondo. The first buck brought to America by the Pattersons was sold at \$2,000. Almost everybody started in on this breed and I remember one neighbor bought five ewes, paying \$25 apiece, whereas he had never paid over 25 cents apiece for them previously. He had always let them run in the fields during the winter and in the spring if they raised any rams well and good; he sheared them, as I have told you, sold them to the butcher, keeping a few over for the next year. When he paid \$25 apiece for them he had some interest in the sheep, he had an investment and was going to look out for it and he did. He took care of his sheep. They were not ragged around the ribs but they were sheared and he was proud of the amount of wool he got; he was proud of their offspring and he made money all along. The principle lay in his investment, his interest in it.

Excuse me for telling a little incident that happened to an uncle of mine who had not gone to church for ten years. He was finally solicited to give a little help to the building of the church in the neighborhood in which he was located. He put \$100 in the building and finally put in another \$100 and he took a pew as a sort of security in the church, and after the church was dedicated he was at church every Sunday. Someone said "How is it, Payne, you go to church so regularly now?"—"Because I have an investment there." When a man has an investment in anything whatsoever he is apt to look after it every day.

To improve the stock in the state. As this question covers no kind of stock in particular, I shall confine myself to dairy stock as Mr. Raven did. As I have said before in this room, everything that conduces to a cow's health, comfort, development, adds to the value of the posterity of that animal,—Governor Hoard called it by a long name, which a good many of us have forgotten, and that is environment, and there are others that have caught up this word. I clipped an article from the paper the other day, showing what Burbank said about it. Burbank, you know, is the great developer in the plant world, and the principles that are true in the plant world are as true in the animal world, perhaps more so. Mr. Burbank says, speaking of heridity, "Heridity is simply the sum of all the efforts of all the environment of all the past generations on the responsive, ever moving life forces." If that does not cover everything I would like to know what does, and he says "environment is the architect of heridity." A great writer of the south says "Inheritance and environment are not only related but they are the most important elements of the everyday life. The thought of yesterday fixes the tendency of today and the conditions of today are the background against which every life is projected." Now there is

another gem of thought, and when he wrote it he did not think of stock, he was thinking of men and women and the forces that make the world. Remember that every thing you are doing in your herd, for your herd, that shall develop the animal of today, is a step for a higher, better animal tomorrow. Raise a good calf and let nothing be neglected by which you can develop a mature animal early in life before breeding shall take place, and you always have to before the question of maternity and the supply of the milk pail comes into service; but if these come first you may never develop a well developed animal.

I like an old principle that used to maintain when I was a boy. The cows used to freshen when they were two years old; they were milked one year, then they were milked two years before they were bred again. I always thought the second year was to develop that heifer into a cow, but they ought to have begun it in the other way, they should have put it in before she was bred at all.

Mr. Raven tells of a herd in Saginaw, where the bull sired 34 heifers and every one of them the first year in milk gave ten thousand pounds of milk. I do not wonder at it a bit. The sire was a thoroughbred sire from one of the best cows ever known in the asylum herd, and the owner allowed the heifers to mature before he undertook to get a profit from them through the milk pail. Not only that but all the time those animals were well cared for. The other day I was riding by a man's farm and saw his cattle out trying to get in the shade of his barn but they could not get nearer than the wire fence permitted, but they were huddling up towards the barn all the same to get away from the cold wind. That man could not expect to get results anywhere. The environment is against him, against his work. I went on a little farther and stopped to see some fat cattle, and while at that farm I saw a pig milking one of the cows. Afterwards I was in the house and talking to the housewife as to her ability to make butter, but she said she did not make much now because the cows did not give much milk. The environment was against them so I do not wonder at it.

There are hundreds of other things, the feeding, the character of the feeding, etc. This association for the last six or seven years in this building has discussed feeds and feeding and some excellent thoughts have been produced. Are the farmers getting profit from those suggestions, are they getting profit, are they getting better results? Has this borne fruit? I say no, Mr. President, not as it ought. I inquired of the herdsman the other day in regard to cow known as "105" in our herd. I remembered that the first year she gave milk her record was not good. I inquired a little about it. If our men do not get the milk I want to know why; there must be some cause, either a careless milker or a poor animal. The herdsman said two of the teats did not give any milk, or very little. I asked what the trouble was, if they were injured. The herdsman did not know, and I instructed him to milk those teats as if they gave the same amount of milk the others did, and to keep at it during the period of lactation. What was the result? The next year she gave from all four teats alike and today is promising to be one of the best cows in the herd. It is the little things. Those little things that some of us would scorn to look after. Every heifer in our herd, when a year old, goes into the stanchion, is cleaned and

freshened every day, her udder and milk veins worked by hand until she develops that udder and those teats and you would almost think she was giving milk. It is a little thing but it does the work, and that is one of the ways to build up a herd.

Now I can imagine in those associations Mr. Raven has organized, I do not care whether it be at Blissfield, Fremont, or some other place, some men will have better results than others. Why? Because they are looking after the little things with the big name called environment. I want to tell you another thing, and I have been investigating in that direction for the last year,—the amount of food that we consume in warming the water our cattle drinks. Do you know that some of our cattle take water on the verge of freezing and has to be raised to a temperature of 101 from a temperature of 32 degrees, and doesn't it take something to do it, and when you take into consideration the amount of water they drink you see it is a large amount. One of the agricultural colleges or experiment stations has given us some figures on this subject. I ran across them the other day and I thought enough of them to copy them. Cows consume, in the first place, 50 per cent more water when giving milk than when dry. That was one of the conclusions the station came to for cows under test. The Ayershire cow required on an average 4.26 pounds of water to 1 pound of milk given; the Guernsey 5.7 pounds of water to 1 pound of milk given; the Holstein 4.43 pounds of water, the Jersey 5.24 pounds, the Durham 4.82 pounds, making an average of 4.68 pounds of water to 1 pound of milk. Supposing your herd averages 35 pounds of milk a day and it requires 163 pounds of water in a day for a cow, every pound of that water has to be raised, if water is given them as I have seen it given, from 32 degrees to 101 degrees F., the temperature of the cow. See what it will cost to do it and you are giving them feed to do it. To show that this is true, I have been experimenting this winter in warming the water for a number of cows and noting the results. I found a great difference. In the first place they do not drink so much water but they enjoy it. If you have one cow then you take a pail of warm water, about twice as warm as you want it, put it into another pail and give your cows two pails of water up to 70 or 80 degrees, if she will drink it that warm. Then you save feed and do a kindness to your cow. I know you can, try it.

Now, Gentlemen, I hope you will excuse me for not occupying any more time, as I find when I talk I talk too fast and too long.

The Chairman: Mr. Raven will answer any question you would like to ask in regard to these associations, or anything on that line.

Mr. Whitney: I wish to say another word. Since I have been connected with the asylum herd we have owned seven or eight sires. We never knew the value of one of them until we had owned him about three or four years. The farmers ordinarily buy a sire and in two years sell him to the butcher and buy another. You cannot find out the value of a sire until you have used him three or four years. We find the best results from those that are from six to eight years old. The best lot of calves in our barn have been born the last year and are coming now from a sire that was six years old when we got him, and I had to buy a whole herd to get him.

Mr. Raven: I am asked a good many times about the cost of this movement. There are two brothers in this state that began with 34 cows that were producing 184 pounds of butter. By the purchase of \$500 worth of sires, selling the sires for \$450 and still having one left on the farm, they increased the yield of butter to 386 pounds, making 202 pounds of butter by the purchase of \$500 worth of sires, selling them and receiving back \$450. I could name you instance after instance where this upgrading has been very profitable indeed to the farmer himself. I do not think Mr. Lillie began with pure bred cattle, in fact I am sure he did not with the exception of the sire. I do not know of a successful breeder in the state that began with all pure bred animals. We find that the successful breeders of the state began with the purchase of a pure bred sire and, as Mr. Whitney has told you, looked after the details, learned how to feed and care for them, so that there came a time when they were able to take care of pure bred animals, and that is the point I want to put up to you men,—to improve your herd by a system of upgrading, so when the time comes that you will want pure bred animals you will know how to take care of them. We have one of the best object lessons in Jackson county that there is in the state of Michigan of a man buying the best cattle he could find and having them go down on his hands, so that in five years he had the worst lot of scrubs I know of. This man was a shoemaker in Jackson who came down to farm at Grass Lake. He bought a large farm and put \$30,000 worth of buildings on the farm. One set of buildings were just completed when they burned up. Then he bought the best herd of Shorthorns he could find in the United States, but in five years they were a herd of scrubs because he did not know how to take care of them. Improving the cattle is an education. The details you have to work out for yourself and each man for himself, but there will be rivalry among the members of an association to do better and I believe the association idea is better than the individual.

Mr. Harris: Who has to feed the sire?

Mr. Raven: The association hires a man to feed and care for the sire, having him centrally located in this group of forty cows. There are provisions made for the use of the sire. One association I have in mind at Blissfield, having three sires, thought there were enough cows so they would take in no outside breeding, so they put up the price for service to \$5.00. No one had ever paid over fifty cents previous to that time, but the three sires bred forty cows outside the association for which the association received \$200 cash, and with it they bought another sire. Some associations allow outside parties to use the sire and some do not. This is all provided for in the rules governing the association.

The Chairman: If there is no further discussion, we will have some music.

Duet on mandolin and guitar.

The Chairman: The next subject on our program is "The use of Farm Manure" by State Analyst Robinson.

## THE USE OF FARM MANURE.

DR. FLOYD W. ROBINSON, STATE ANALYST, LANSING.

Mr. Chairman, Ladies and Gentlemen:

It seems strange that we are a nation that is noted for its great wealth and the many natural resources that it has, that it should also be a nation noted for a great prodigality of its wealth. That is we are one of the greatest wasting nations on the face of the earth. We have a country here which is abundant in its natural resources, which has nearly every facility and every product with which man should be concerned, or that it is necessary for him to be concerned with for the maintenance of life, and we have these products in abundance. We have gold, we have silver, iron, coal and wood; we have the forests and have the soil that will produce almost any crop known and we have a great many very wealthy men. We are a nation that is noted for its wealth and abundance of its natural resources, and at the same time we are a nation that spend uselessly and extravagantly more money than any other nation under the heavens.

It is indeed strange that a nation that is so well provided with natural resources should be noted for its extravagance. We have fresh in our minds the result of the depletion of the New England soils. One would think, knowing as we do the history of those soils and conditions under which they have been cropped year after year without any effort whatsoever to return any equivalent to the soil that those crops removed, after we have seen the result of such treatment one would think that when we settled a new territory, in new climate, in new lands that we would remember the conditions that confronted us and the results that confronted us now as a result of our injudicious care of that soil and would carry that lesson into the tillage of our modern and recently cleared territory, but we have not done it. We have the lessons of the New England soil at hand and we have come into Western New York, have come into Michigan and have done exactly the same as they did in New England, we have cropped the soil continually; and now that we have reached the limit of our production in some of our central states we have gone into the Dakotas, Minnesota, Manitoba and are doing exactly the same thing out there that we did in Michigan and Western New York, and as we formerly did in the New England states.

There was a time not long ago, I can remember it myself, when it was not rare for ordinary farmers to grow 45 bushels of wheat to the acre, but it is a rare thing for the farmer to grow forty bushels to the acre at the present time in the soil of Michigan. We have seen the crop producing value of the soil reduced from fifty to twenty-five, fifteen, thirteen bushels to the acre, and I venture to say that at the present time the average crop producing capacity of the soil of the state of Michigan is more nearly all bushels of wheat per acre than 13 bushels. Why is this? A productive soil is the greatest legacy that could be left to a growing nation, the greatest legacy you can leave to generations to come is a productive soil.

What has caused this nation's waste or prodigality of our natural resources? This prodigality does not consist in the numerous crops we have removed from the soil; our prodigality does not exist in the amount of natural resources we take from the soil; it does not consist in a violent display of the principles of health and, by the way while we speak of that point, this nation is known as the nation that wastes its wealth more than any other nation of the world. We have here a good climate, rainfall in abundance and all those natural conditions which should be conducive to good health, and we waste it. Now our extravagance does not consist of the enormous crops we remove from the soil, it does not consist in the overwhelming use of the opportunities for health with which we are endowed and it does not consist in a removal of the forests, but our prodigality, our extravagance consists in a failure to return to the soil the proper equivalent of the crop removed and in a failure to brace ourselves physically and hygienically in such a way that we will have an abundance of health to spare; we do not take proper care of ourselves. It does not consist in a removal of the forests because we need the forests, we need them removed, but we ought to put them back again; our prodigality consists in not returning to the forests the equivalent of what we removed.

I remember two or three years ago I attended a farmers' roundup institute and this question of conservation of the soil was under discussion. The question was raised whether it was advisable to grow crops of corn with a larger percentage of protein content. In the last few years there have been quite a good deal of inquiries throughout the corn raising sections of the United States as to the advisability of breeding corn and cultivating it with the object in view of increasing the protein content of corn, because we know protein is the most valuable constituent in a food stuff, and it has been conceived that it was a good idea to attempt to raise corn, to breed it and grow it so we could raise corn with a higher content of protein. This has been the result of some of Mr. Holden's experiments in Kansas. The question was raised by one man that he did not think it was a good idea to encourage the growth of those maximum crops containing a high per cent of protein because it was too much of a drain upon the soil, but when you grow corn with a high protein content in order to produce that high protein of corn you have to draw upon the soil for the nitrogen in the soil. Nitrogen is the most valuable ingredient we have in the soil, consequently the idea was that a high protein content was not desirable for that reason and a maximum crop was not desirable for the same reason. He lost sight of the very important fact that we are growing this crop not for the sake of the crop and not for the sake of the soil, but we are growing this crop to feed humanity, and that the man that can grow two bushels of corn where one bushel grew before is that much better, is doing that much more for humanity than the other. Now it does deplete the soil to grow two bushels of corn where one grew before and it depletes it more rapidly, possibly, than to grow only one bushel of corn, but the object of successful agriculture is to grow a maximum crop. Now if we grow a maximum crop we have to treat the soil and conditions so we can grow a maximum crop, and if we want to grow a high protein content of corn that may or may not be desirable, but for the purpose of this discussion it explains the point,

if we are going to grow a high protein of corn we have to put back something in the soil that puts back in the soil what that protein content and maximum crop removed.

The soil must yield a net profit and how are we going to make it yield a net profit. It can easily be conceded, as we frequently make the argument with the dairy cow, that after we have paid a certain amount of money to feed the cow then the more we can give that cow to handle the more profit we will get from that cow. If it takes more rich fertilizing material to furnish an average crop, it does not take as much more fertilizing material to produce a maximum crop. After you grow a certain amount then to increase the growth is done at a much greater profit than is the first small or average crop grown. You can grow a maximum crop how? By inoculating the natural by-products of the soil. Yes it can be done by inoculating the natural by-products of the soil and by the use of commercial fertilizers, but that is another point to consider.

We are growing not only a maximum crop but we must grow this maximum crop economically, so if we are going to benefit humanity in the way we must, we are going to grow this maximum crop at the least possible expense, and how are we going to do it? Can we do it by ignoring the natural by-products of the soil or wasting the products of the soil? It cannot be done. We can take an acre of land or a farm and by the use of commercial fertilizers can build that soil up into a high state of fertility, but it is not desirable because it is too expensive. We should return to the soil the equivalent of the crop we removed in animal manure, and then we have another duty which we will touch upon in a moment.

The prevention of the waste of farm manure is the key to the production of the maximum net profit in the soil. I say the prevention of the waste of farm manure is the key to the production of the maximum net profit in the soil. If that is true, upon what does the value of a farm manure depend? What is the basis of a farm manure? Of course we all know that the basis of a farm manure is the crops produced from that farm. What is the composition, the growth which takes fertility from the soil? We will take for example the sugar beet. The sugar beet is a plant that contains all the elements that are necessary to a plant growth, and it extracts all the elements necessary to the plant growth from the soil and extracts them in considerable quantities; but the product that we seek to get, the product that we seek in the growing of a sugar beet is the product that in itself takes absolutely no fertility from the soil, but in order to get this sugar that is in the sugar beet, in order that Nature will form the crystals of sugar in the sugar beet, it is necessary that certain vital essential ingredients of the soil be taken up at the same time and when there present act as a laboratory or the laboratory reagent by means of which this process takes place. What are the materials, First it is nitrogen. What is nitrogen? Nitrogen is about four fifths of the composition of the atmosphere. This element is essential to plant and animal growth but in the form in which it exists in the atmosphere it is of little value to plants and to animals. It is in its inert form. It does not burn, it has no vital action in breathing, it does not support composition in anyway, it is not poisonous there nor is it explosive or dangerous to



handle and it is not good to eat; but when you take this nitrogen and put it into the soil in the form of nitrate of soda and nitrate of potash, there it is in a form in which it can be assimilated by the growing plant and it is a great stimulant to plant growth when in the form of this nitrate. When it is in the sugar beet plant in the form of albumen, or protein as we call it, it is a very essential food constituent. You know protein is one of the most valuable food products we have. Protein is what makes the albumen and casein of the milk, it is what makes the lean meat, is what makes albumen in eggs, the most essential food constituent that we have; in fact it is possible to sustain life indefinitely on protein or albumen or this nitrogen compound when converted from the atmosphere, first into the nitrate in the soil, then into the plant in the form of albumen, and this same nitrogen in the form of prussic acid is the most deadly poison known to man; take it in the form of dynamite and it is one of the most deadly explosives that we have; so you see this nitrogen that is so inert in the air is so valuable as a fertilizer. It costs twenty cents a pound as a commercial fertilizer; it is so valuable as a food stuff, so dangerous as a poison and explosive, is all the extremes of nature, and is one of the most interesting elements with which we have to deal.

When the cow eats sugar beets she consumes this protein which in another form is so valuable as manure, and then she consumes something else, she consumes potash that is so abundant in the sugar beet, and in another form it is one of the valuable constituents of Nature for plant food, and in other forms she consumes phosphorous. So important are those three that they have been designated as the "tripod of agriculture," the three points on which successful agriculture depends. We add lime to them and possibly two or three other constituents, but those three things are the three points upon which successful agriculture depends, and they exist in farm manure. The basis of farm manure is the natural food stuffs which contains those substances in the form of protein, in the form of starch, and in the form of solids.

Excrement from animals comes in two forms, the solid excrements and liquid excrements. How are they produced which gives them a difference in value? The solid excrement in an animal we all recognize as being that portion of the animal's food which has not been digested by the animal economy, and that represents from one quarter to one-third of all the food that an animal eats. That is solid excrement is the undigested portion. Liquid excrement of an animal represents the digested portion of the animal's food and represents from two-thirds to three-quarters, and sometimes a little more than that, of all the food that an animal eats. Naturally you would suspect the ingredients in the food stuffs that have become digested, by means of which they have become broken down and rebuilt into other organs in the animal body, have become soluble in the juices of the body and put into the blood in soluble form, naturally those products are wasted more easily than are the undigested portions which have withstood the attack of the animal's digestive system, consequently the problem for the conservation of farm manure, the greatest problem, is in the conservation of those two-thirds or three-quarters of the value of the food taken by the animal and which, by its particular construction after treatment by the animal, is more easily wasted.

I remember reading that little valuable book called "Roberts Fertility of the land," perhaps some of you have read it in the Farm Home Reading Circle. It deals with this question of the waste of farm manure and sometimes in a cartoon or picture you can read more if you study it for a few minutes than you can by reading chapter after chapter of prose. You turn to one of the pages and see that sketch drawn there by a Japanese student for his composition on the waste of farm manure. It was taken from the examination paper of a Japanese student at the Cornell University, and represented what we have all seen, the picture of a barn or barnyard on the hill, with a little brook running down below, possibly 15 or 20 feet lower, and a whole lot of Brownies there busily working on that manure pile in the barnyard. One was labeled nitrogen, the label of the next Brownie was phosphoric acid another was labeled potash, and all that manure was exposed to the elements on the hill side. That group of little Brownies was busy all the time working with spades, shovels and pails delivering all those fertilizing constituents to another who was carrying them down and dumping them into the little creek. There are a great many possibilities to be seen in that picture and he had the right idea, that the only forces that were at work were those natural forces and they were gradually carrying all that wasted manure into the creek, where it swept off, becoming a source of pollution for the city a little further down the stream.

Now I am not going to dwell on this question to any extent except to say something further along this line, that at the present time the question of preserving the fertility of the soil is not the only question with which we have to deal. We can preserve the fertility of the soil with barnyard manure but you cannot conserve the energy of the soil with barnyard manure alone. I will tell you why. You can restore lost vitality of a soil by the use of barnyard manure and you can bring it to a state of production with which it has never been familiar before. That is more increasing the fertility of that soil than it is conserving the fertility of the soil, but when you put on a crop of clover the only ingredient you return to the soil that was not there to begin with was nitrogen; you put nitrogen there, and when you return a covering of barnyard manure you put back no ingredients that were not originally taken from the soil but you put them back in a different way. We know that barnyard manure is valuable out of all proportion to the nitrogen, phosphoric acid and potash present and I would not have you value your barnyard manure by the quantity of those present. Why is it more valuable? Not because it has valuable constituents in it for it has not but simply because it has organic matter there. What is the use of this organic matter in the soil? Organic matter in itself, by itself alone is not a valuable constituent for plant growth. That is built up anyway because of the presence of those other mineral constituents in the soil, but these organic matters put back in the soil by the clover and barnyard fertilizer undergoes decomposition in the soil and when it undergoes decomposition it liberates carbonic acid gas and carbonic gas then goes to work unlocking the mineral constituents already in the soil, and so while we get our increased value from the use of barnyard manure there and take up the potash, phosphoric acid and nitrogen that is present also, we have put to work in that soil a labora-

tory which is furnishing the key to the unlocking of the compounds in the soil that agriculture and agriculture culture does not do by itself, consequently we are taking from that soil, by the use of barnyard manure, a little more each year than the year before and if we put back barnyard manure alone we will not return the equivalent.

I do not want you to get the wrong idea about this discussion I do not want anybody to say I am discouraging the use of barnyard manure, but on top of all the barnyard manure you can produce and put back on your soil, if you want to feed next year more people than you are feeding this year, you have got to do that, you have to put something else back there and you have to put something in the land, at the present time it is called "commercial fertilizer," to compensate that soil for the amount of unlocking that is going on due to the presence of that barnyard manure.

How are we going to prevent the waste of these farm manures? Mr. Hull thinks the covered barnyard is one good way and it seems to me that is a logical suggestion. Then we must take care of this liquid excrement that consists of two-thirds to three-quarters of all the food that is consumed by those animals, which so easily escapes and becomes a menace to the health of the community from a pollution of the well nearby. We must preserve that, we must get it on the soil as soon as we can because the product is never so valuable from a fertilizing standpoint after standing, unless you have been careful to preserve that essential element that is there present, as it is the time it is produced. Of course we cannot put it on the soil at all seasons of the year. It would not do any good to bring out manure when the ground is all frozen and it would float off. We must take care of it and put it on the soil at a time when it will be taken up by the soil, where it will not run off down the drain into the river. How are we going to do this? Manifestly in the care of the dairy stock some absorbent should be used. What absorbent shall be used? Shall we use lime? The best way to determine whether or not it is a good thing to use lime is the way in which I heard our revered Dr. Kedzie explain the use of lime at one time. He said it was such an excellent disinfectant that one poultry man coated his poultry house with lime and then scattered lime all over the drippings in the poultry house. He went out there the next morning and there were about two dozen of his best fowls laying on the ground dead because of the natural chemical change which had taken place between the lime and the organic matter of the fertilizer, by which ammonia had been liberated and suffocated the fowls. Lime does not make a good absorbent and lime and barnyard manure do not work well together. Land plaster would make a good absorbent but we have to be careful on what kind of soil we put land plaster. Do not put land plaster on a soil that is too light because land plaster encourages the destruction of organic matter in the soil. Probably the best absorbent that is available to most dairymen is straw or chaff and it is an excellent way to promote the decomposition of that straw and get it back again on the soil.

We have to take these things into consideration, this question of preserving and conserving the fertility of the soil if we are going to leave to our children, upon whom will fall (and we cannot fail to

recognize this point) far greater problems than we are called to solve, if we are going to leave them the legacy of a productive soil.

## DISCUSSION.

Mr. Miller: I claim it costs more to work an acre of poor land than it does good land. Land that is in a high state of cultivation requires more work to plow and break down that soil and get it in a condition to raise a crop. You ask why it is that the land is getting poorer all the time. If you visit every farm in this county, for instance, and go by the barnyard you will find an answer to your question. I claim the liquid, with what it takes with it to the soil, is more than one-half of the proceeds of the cow. With that manure that you are telling so much about, I do not believe you can find a barnyard clean of it today. I heard a man say this afternoon that he was going to build a barn this summer and he was going to set it at the head of the ravine so the liquid from the manure would run down that ravine. I would not allow it to do that, I would put some sort of absorbent there that would drink up that. I think the time will come when there will be a law passed prohibiting throwing manure out of the window. There ought to be such a law. If we are going to save this nation from poverty we have to conserve the manure that is being thrown away. If a man does not know what is right, pass laws to make him save that manure and put it back on the farm instead of letting it leach down. I would rather have it drawn out today and put on the frozen ground rather than let it lay in the yard until spring and run down. The liquid part of it will take a certain portion of the soil. I would rather draw it out every day and when I get old enough so I know how to farm I shall draw the manure out every day. I am only 76 years old but I know how things ought to be done, and I would never allow the manure to be thrown out under the eves.

Mr. Lillie: I would like to ask Dr. Robinson what he would think of floats or ground rock phosphate as absorbent in the stable, as compared with land plaster?

Dr. Robinson: I think the use of phosphate as an absorbent is a first rate idea because if that idea can become popular you are going to put back on the soil just what we are discussing a moment ago, in part at least, the phosphoric acid that was removed, which does not all go back and we are building a little more than we had to start with. The use of a phosphate as an absorbent I have not observed enough to realize whether it makes a practical absorbent, but if it does the idea is right.

Mr. Lillie: That is the point I would like to get your opinion as a chemist on. You, of course, know the nature of phosphate rock. By mixing that with solid and liquid manure, would that tend to make the inner phosphoric acid in the rock soluble?

Dr. Robinson: Certainly. There is organic acid in the manure that would begin to work on the rock immediately. Rock phosphate should be very fine.

Mr. Lillie: It is just as fine as dust.

Dr. Robinson: That ought to work nicely.

Mr. Raven: There is one statement the doctor made with which I

do not agree, that is in regard to spreading the manure especially during the winter months. He said it would wash away and run into the stream. Our manures are all made on the cement floors and we use floats or phosphate rock, have used several tons of it. All the floors in our barn, with the exception of the horse barn floors, are of cement and I have had them for twenty years. We find the best absorbent we ever got in the world is the refuse of shredded corn fodder and we have found nothing better on the farm that would absorb the liquid of manures, which are all held intact or are all on the floors of our stables because they are made of Portland cement and whitewashed until they hold water. We dry that with land plaster or those things we have in the barn, put that into the manure spreader and spread it immediately on our fields. We find wherever we spread it on fields without a growing crop on them there is a waste of manure. We have top dressed our wheat fields and our rye fields. We cover all our clover fields that we put in corn next year. We know how many loads of manure we put out each day, and this year we are putting out eleven loads of manure on every acre which we will put in corn next year. We top dressed our wheat fields and rye fields with three loads of seventy bushels each per acre, and so I was surprised to hear the doctor say there was a waste. He said manure is the most valuable at the time it is made. That is my belief and if it is the most valuable at that time, that is the time to put it in the soil.

Mr. Lillie: You say you find there is no waste. How do you know? Such things are not detected by the eye.

Mr. Raven: Possibly that is true. No man can tell by the color of the water that is running out of a barnyard whether it is carrying with it nitrogen, phosphoric acid or potash, but he thinks it is fertility. I have a rolling field and used to spread the most of the manure on the top of the field, but now I use it all alike and can see no difference in the production of crops on the brink of the hill, on the hillside or bottom.

Dr. Robinson: You show me a stream that is running from a hill that is straw colored and I will show you one that is loaded with ammonia.

Mr. Raven: I will take you to a place where there is a field and I will show you potash and ammonia without this field being manured, and the richest soil is where it goes into the ditch.

Dr. Robinson: Take soil that is covered with a coat of ice over the top and take manure spread on that soil, and you no doubt have seen it percolate off through a stream of water through the little dead furrows in the field. You take that water, colored yellow, and analyze that, compare it with the strained water running underneath the soil and there will be no comparison from the standpoint of fertility. That running off the top is loaded with fertility and it cannot get into the soil. It is loaded and has to run off.

Mr. Hull: Is it not possible to find that discolored water that has run off the surface of fields that are not frozen? In that you will find as large an amount. I have heard Dr. Kedzie say he analyzed where it had run over something green, and where there was pigment in the water there was only a trace of plant food.

Dr. Robinson: That is natural to explain.

Mr. Lillie: You advocate putting the manure on the land every day?

Dr. Robinson: There is one other point that brings up. I said at the beginning that the value of a farm manure was out of all proportion to the nitrogen, phosphoric acid and potash it contains. You are taking nothing into consideration but the nitrogen, phosphoric acid and potash that is there. When you put the manure as a top dressing on the soil you lose almost entirely the unlocking value that manure has and when you put it on the soil you put the nitrogen, phosphoric acid and potash in the soil and then you have your organic products there, the decomposing straw and the decomposing chaff which acts as a laboratory unlocking the other locked nitrogen, phosphoric acid and potash.

Mr. Hull: How much in this rather, we will say, sandy soil in this section, knowing the absorbent power of the soil as you do, how much would you expect would reach down so far the plants would not get it?

Dr. Robinson: I should not expect, if you put manure on any of these soils around here, much would get away and I would put it on so you can use it all.

Mr. Lillie: In top dressing the soil, suppose some of the manure does dry up, becomes dry and loses its moisture, the moisture evaporates from it, but that eventually becomes incorporated with the soil and we get the benefit of that organic matter just as much although not as quickly. We do not lose anything in the form of organic matter in the soil.

Dr. Robinson: I think you do. You put in a bunch of dry straw and it will remain for years without decomposing, but take that product in the condition in which it comes from the barnyard, by means of which the bacteria content is well incorporated and decomposition has already set in, and you will get better results.

Mr. Lillie: There is another point that comes in that question right here that has been brought out, and that is when this manure is put on the surface of the soil you have the effect of a mulch. Dr. Robinson is not a practical farmer and is analyzing this question from a chemical point of view. I believe the place to put manure is on top of the ground and not in the ground but it is not practical to do it because we want to haul the manure out every day. You save it with the least possible loss, you save time in handling the manure and get the work done in the winter when you have time. I want to ask Dr. Robinson another question. Supposing you take those floats or inert phosphate rock and put it on a clover sod, that is every day we put a thousand pounds per acre on clover sod that is short, and then plow down the sod that is short; or next spring, when that sod begins to decay, that organic matter in the roots of the plant begins to decay, will that not also form organic acids which will have the effect in part at least of changing the phosphoric acids from this inert condition to a soluble condition?

Dr. Robinson: It certainly will and then you put it on ground and that decomposing process goes on more rapidly.

Mr. Lillie: Regarding the idea that Dr. Robinson has of spreading manure on frozen ground, there probably might be some loss, but I would hate to have anything he said here discourage anybody from drawing manure out every day and spreading it on the land where they

want it. You can do it with the assurance that you are taking care of your manure in the best possible way with the least possible loss. That is an established fact today among the best practical farmers in this country.

Mr. Hamil: I would not leave my manure stand in a heap in a pile but at the same time I put it where I thought it would have farther to wash.

Mr. Lawson: I do not see how anybody can avoid drawing out the manure in the winter, especially where they have any amount of manure. We draw manure in the early part of the winter and put it on the snow and before the snow melts there will come a thaw, the ground will freeze, and consequently when the snow goes in the spring the ground is covered with ice, especially where the land is level. I have not seen any bad results from spreading manure in the winter, in the fall or in the spring. I think I get better results in spreading in the fall before the ground freezes. I do not think I lose much in spreading in the winter because the expense of rehandling it and drawing it again will more than counterbalance the loss, and I found any place or time I put out a load of manure I got results for seven years. I bought a farm that would not grow corn and last year my corn grew fine, I had a good crop.

Member: It seems to be the opinion among a great many farmers, which I think is an erroneous one, that this soil leeches. I saw an experiment which Dr. Robinson probably saw too. They took plants of some kind, some weeds among the rest, that had quite a little potash on them, and treated the ashes with some kind of reagent. They then took some of the liquid and put it through three inches of soil and there was no reaction. That showed the soil absorbed it readily.

Dr. Robinson: That is very true. It is as I answered Mr. Hull's question, if you can get the fertilizer on the soil at a time when the soil is in a receptive capacity there is no danger of any of it running down. There is just this point that Mr. Lillie raises here, regarding which I would like to ask this question, if you had frozen soil conditions. Suppose you had a covered manure shed, would you put it on the soil or in the covered manure shed?

Mr. Hull: There have been three weeks in the last three years that I would not put manure out.

Mr. Lillie: I do not think we can afford to have a covered manure shed. When there comes a time like you refer to, we draw the manure on the field and when conditions are right take the manure spreader and spread it, but there are only a few days in the year when conditions are not proper so we can spread the manure. Some experiment stations have made an experiment of putting manure on a side hill in the winter, under ordinary winter conditions, ground frozen and covered with snow. They spread manure half way down the side hill and they raised a crop on that side hill the next year and one could plainly see where the manure was put in the growing of the crop. This shows pretty conclusively in my mind that when we put the manure on the field in the winter, especially if covered with the snow that there is not much danger but it will do good.

Mr. Weld: This has been a most interesting discussion and I believe a most valuable one because the conversation of the natural resources

of the farm cannot be too strongly emphasized. There is one point, however which has not been touched upon. I think it is Dean Cook, of New York, who says the cow has been developed more as a manure machine than as a producer of milk. I think sometimes we do too closely associate the two things. I realize full well that this is a discussion of the conservation of fertility in handling the manure and I realize full well that the milk question does not come in here, but in the future, I believe, more than in the past, we have to take into consideration some other points and if we are going to develop a plan for the handling of manure, I believe that plan would be most successful which necessitates the handling of manure the least number of times. I do not believe we can adopt a plan that would make it necessary to handle and rehandle that manure. During the last few years it has been clearly shown that this same manure is one of the most common ways by which diseases are transmitted from animal to animal. That being true, and it has been proven beyond any possible doubt, why would it not be a good plan to get this manure out of the way from our buildings, get it from under the eaves, from under the barn and from the various places where it is stored, get it out on the land where it will be doing some good? To be sure some may be wasted, but I do think there is another element to be considered, the conservation of farm labor and conservation of the health of the farm animals, which should be considered in connection with the other problems.

Dr. Robinson: There is no question, Mr. Chairman, but in the matter of economy of any description that sanitary measures or measures for the protection of health take precedence every time. There is no doubt of that.

Mr. Sauer: I want to tell Mr. Miller if he thought his manure was better on top of the ground that plowed under, not to plow so deep. I used to plow nine inches but I believe the more shallow we can plow the better it will be. I believe the sooner the manure is drawn out the better it will be.

The Chairman: Gentlemen, I think we had better draw this discussion to a close. The next paper will be read tomorrow morning, and we will now stand adjourned until 7:30 o'clock this evening.



## THURSDAY EVENING SESSION.

Meeting called to order at 7:30 o'clock by President Lillie, of the Michigan Dairymen's Association, and opened with music on guitar and mandolin by Miss Nora Barnes and Mrs. Lena Brown.

The Chairman: The first topic on the program this evening is a paper on "Milk as Food," by Sarah T. Clave, of Traverse City.

## MILK AS A FOOD.

DR. SARA T. CLAVE, TRAVERSE CITY.

Mr. Chairman, Ladies and Gentlemen.

The facts contained in this paper were obtained from Bulletin No. 41 published by the Government Hygienic Laboratory, January 1908, entitled "Milk and its Relation to the Public Health."

## PHYSICAL CHARACTERISTICS.

Cows milk is white or yellowish white; it is opaque because of the calcium in combination with its casein. Its sp. g. varies from 1.028 to 1.033 with an average of 1.031; its taste is pleasant and characteristic; the addition of acetic acid causes a flocculent precipitate and on the addition of rennet it coagulates into a firm mass.

Reaction—When freshly drawn it is amphoteric or slightly alkaline; on standing it soon becomes acid.

Composition—Milk contains all the essentials of a perfect ration viz.: proteids, carbohydrates, fats, inorganic salts and water and besides is easy to obtain and easy of digestion hence it is an important food for sick and convalescent persons as well as infants. Its greatest importance is as a substitute for mother's milk in feeding infants during the first year of life.

Milk of different breeds of cattle varies chiefly in the content of butterfat the other ingredients being remarkably constant in their proportions.

Holstein cattle produce milk with the lowest fat content three per cent, and Jersey with the highest five per cent. According to the analysis of the U. S. experiment station good herd milk is composed as follows; fat four per cent, proteid 3.5 per cent, salts .75 per cent, sugar 4.5 per cent, water 87.25 per cent.

Proteid—The proteids of cow's milk consist mostly of casin in combination with calcium, lactalbumen is present in small quantities.

Fat—The fat is the element most subject to variation ranging from that of Holstein with three per cent, to Jersey with five per cent.

Sugar—Sugar is present in the same proportion as in mother's milk.

**Salts**—Inorganic salts are present in .75 per cent, of which calcium and phosphoric acid are most abundant.

**Bacteria**—Cow's milk always contains large numbers of bacteria, their number increasing with the age of the milk and the condition under which it is kept.

**Cream**—Cream is cows milk rich in fat to excess. It differs from other milk but slightly in other solids. The market cream varies from eight to forty per cent of fat.

Milk presents the strange contradiction of being the most wholesome single food stuff and at times the most poisonous of all foods as it has been known to contain so virulent a poison as to cause death in a few hours. Of all foods milk is the most difficult to preserve pure and to handle with success. It requires not only intelligence but a high degree of training as well as incessant vigilance to produce a clean and safe milk. One of the most important duties of the health officer should be to insure a pure and safe milk supply.

Since it is the food of the new born and the most important aliment of the sick and aged, it should not be allowed to become a promoter of disease or an instrument of death.

Statistics show how large a proportion of all the deaths are among the children. Bergeron says that the chances of a new born child surviving a week are less than those of a man of 90, and of living a year less than those of a man of 80 and the greatest cause of death in children is gastro intestinal diseases. In 1900 the infant mortality in Michigan per 1,000 was 121.1.

A child artificially fed consumes about 500 quarts of milk during its first year and for the first nine months there is rarely any other food given so we see what is the direct cause of a large percentage of deaths in infants under one year.

The gastro-intestinal disease of children prevail in the hot months of summer, when the depressing effects of the heat seriously affects the resistance of the children and at the same time the heat favors the growth and multiplication of the bacteria so the child is least able to withstand the infection when the milk contains the largest amount of disease germs. Boiling destroys these disease germs and this may be done during the heated term but children fed too long upon boiled milk become flabby and anemic and the subjects of scurvey whether it is from the heating or some other factor in the milk is not determined.

Milk may be pasteurized which does not render it so objectionable as does boiling but pure milk used raw is much more wholesome.

*Infected milk* is milk contaminated with patho genic germs as those of typhoid fever, scarlet fever, diphtheria, and the like which infections have been the cause of many epidemics both in this country and in Europe.

The characteristics of a milk epidemic is its explosive onset. This is due to the fact that a certain can or lot of milk receives an amount of infective material from contact with an infectious person, premises or water. If this be mixed in a dairy or distributing station with milk from other cows, in case the milk has been kept cool, only susceptible persons or those using milk in unusually large quantities are made sick but if the milk has become warm through lack of care or long transit the typhoid germs have a chance to multiply and each quart

may contain more germs than the original can and a wide spread epidemic occurs from a small amount of original infection—so children in different schools and in families of different social status fall ill at the same time.

Pasteurization as applied to milk consists in heating it for a short period of time at a temperature below the boiling point followed by a rapid chilling. Its object is not so much to preserve the milk as it is to destroy the harmful bacteria and their products.

Pasteurized milk must be handled with the same care as the raw milk if not greater as the pathogenic germs grow more rapidly in heated than in raw milk. The germicidal properties of the milk are destroyed by the high heating and the surviving bacteria do not have so hard a struggle for existence in the heated milk.

The method of pasteurizing milk is to heat it to 60 degrees C. or 140 degrees F. for 20 minutes and cool quickly.

Bring water to a boiling point in a vessel with a tight lid—remove it from the stove and place on a non-conductor of heat as asbestos or a board. Put bottles up to the level of the milk in this vessel cover the utensil and leave 20 minutes—cool rapidly by the means of cold water and keep on ice until required for use.

The most obvious changes in the milk in which we are familiar are those that are brought about by bacteria or various other micro-organisms. Among these changes may be mentioned. The ordinary souring and curdling of milk with the production of lactic acid as the chief product; the production of various odiferous substances or highly flavored substances as those met with in the ripening of cream and cheese; the formation of mucin like substances serve to impart to milk a characteristic ropiness, and finally that bacterial changes which result in the formation of poisonous substances as tyro toxican, toxins, etc.

The lactic acid fermentation is the commonest and best known, it is this that causes milk to turn sour and curdle at ordinary temperature. The organisms known as the lactic acid group gain the ascendancy in raw milk and these bacteria have a restraining effect upon the great majority of other species.

The ripening of cheese is due largely to the action of the germs that cause the lactic acid fermentation.

There has been a great fad of late in using sour milk as food as the Russian scientist Metchinkoff has asserted that the lactic acid germs in the intestinal tract lessen intestinal purefaction due to other germs and since much of disease comes from auto intoxication or absorption of poisons from the intestinal tract the keeping of the lactic acid germs in the alimentary canal will prevent disease and prolong life. Some enthusiasts even declare it is the famous elixir of life long sought by the human race and drug houses, have a tablet containing pure lactic acid bacteria which can be added to sweet sterilized milk and thus insure the presence of no other germ in the artificial butter-milk produced by the acid of these tablets.

The organs of assimilation in infants are so undeveloped that there is not a wide range for a dietary—infants require the same five food elements as adults and we find that milk contains all these elements.

To be wholesome food milk should be clean, fresh, unadulterated,

free from disease germs and their products, and it should be kept cool. By clean milk we mean milk from healthy cows, collected under hygienic conditions and handled with proper precautions so it reaches the consumer without containing any visible particles of extraneous matter as well as any excessive number of bacteria.

Milk is not sterile when it comes from the udder of the cow and as it comes from the udder it receives bacteria of various kinds; certain of these come from the milk ducts of the cow and the dust and dirt of the stable and these are not often disease germs—others come from the hand and clothes of the milker and from the pails and cans used for milking, storage and transportation and these may or may not contain disease germs.

Tubercle germs may get into milk from a tuberculous udder or from particles in the barn dust thrown out by the cow in coughing or with the manure.

By fresh milk we mean milk less than 24 hours old when delivered, by the ordinary methods of handling, milk has undergone such fermentative changes as to be unfit for the use of young children after 24 hours old. Milk should not be robbed of its cream by skimming nor should color be improved by artificial means and no preservatives should be added to retard its souring.

Milk should be promptly cooled to a temperature of 45 degrees and maintained the temperature until the time of consumption. This temperature 45 degrees F. and 77 degrees C. prevents the multiplication of bacterial content and also diminishes their number. In the winter this is easy to accomplish; in the summer it demands efficient methods of cooling on the part of the dairymen, the transportation company, the jobber and the consumer after it is delivered.

O. Heubner, of Berlin, was the first investigator to make an exhaustive study to determine the principles of *infant* feeding. He worked it out on a logical basis as is done for adults—that is how many calories per kilogram of body weight are required for the purpose of growth and nutrition. He found that an energy quotient of 70 calories was the minimum on which a child of less than one year of age could maintain its weight and then more than 100 calories per kilogram of body weight causes nutritive and gastro-intestinal disturbances.

The determination of the caloric value was made from what was known of the value of its elements of composition thus one gram of fat produces 9.3 calories, one gram of proteid and one gram of carbohydrate have each a caloric value of 4.1.

The symptoms of over-feeding are irritability, restlessness, broken sleep, constipation, with dry grey stools; a continuation of the cause induces severe gastro-intestinal symptoms, vomiting and diarrhoea are present with discharges containing curdy masses of fatty soaps. The gain in weight diminishes, ceases or a loss is noted.

In comparing mother's milk with cows milk we find very little difference in the sp. g. the total solids being about the same though the proportions vary somewhat the chief difference being in the proteid, cow's milk contains an average of 3.9 per cent of proteid while mother's milk contains 1.5 per cent but the proteid of cows milk is almost as easy of digestion and it is the over abundance of fat used that causes the gastric disturbances.

A fat content of about 3 to 3.5 per cent is the right proportion for infant feeding.

Holstein milk contains this proportions of fat so may be used undiluted after the first month but other milk must have a portion of cream removed from the bottle and then be thoroughly mixed.

#### GENERAL DIRECTIONS FOR THE FEEDING OF CHILDREN.

For a child one month old and over the child should be weighed and a daily quantity of cows milk equal to one-seventh of the body weight of the child be given up to three months old, from three to six months old one-eighth of the body weight after that age one-ninth to one-tenth. If the milk contains four per cent of fat remove one ounce of cream from the top of a quart bottle, if four and one-half per cent remove two ounces, if five per cent remove two and two-thirds ounces and the remainder well mixed furnishes the portion of fat nearest to that of the mothers milk.

If a child one month old weighs nine pounds, one-seventh of its body weight is nineteen ounces which amount should be its daily ration of milk. This should be at once divided into the required number of feedings and kept cold until needed for use when it is warmed by standing the bottle in hot water.

Under one month the preparation should be as follows:

First week skimmed milk.

Second week one-third whole and two-thirds skimmed.

Third week one-half whole and one-half skimmed.

Fourth week three-fourths whole and one-fourth skimmed.

After the seventh month some cereal should be added as oat meal or barley gruel.

The Chairman: We will vary our program now by calling on Miss Rea Martin for a reading.

Reading by Miss Martin, which was much appreciated by the audience.

The Chairman: We will now call on State Analyst Robinson for his talk on the Chemistry of Life. I have great pleasure in introducing to you the Chemist of the Dairy and Food Department, Dr. Robinson.

#### THE CHEMISTRY OF LIFE.

DR. FLOYD W. ROBINSON, STATE ANALYST, LANSING.

Mr. President, Ladies and Gentlemen:

From the time that the world was formed chemists have been engaged in the effort to change the baser metals and minerals into the rarer metals and minerals. At the time when the ancient alchemist plied his vocation it was necessary that he should ply his vocation somewhat stealthily because the condition of men's minds at that time was not such that they would entertain the superstitious views of even the al-

chemist of those days and while we have some of the record that was made by those ancient alchemists (who, by the way, are the predecessors of the modern chemists) which is very fragmentary, yet it shows a very earnest effort and a valuable effort in the search for truth. The alchemist considered matter to consist of but few elemental substances,—water, air and fire, and those substances were considered to be indestructible and indivisible, and it has been in comparatively recent years only that we have been able to break up that old idea concerning the composition of matter.

It was only in the latter part of the 18th century, that a man by the name of Priestly discovered that in this so-called elemental substance, air, there was another substance. This substance he named oxygen. This was discovered in 1774, and was practically the beginning of the dissolution of the ideas of the old alchemist, and the birth of modern chemistry.

But the effort of the old alchemist was not directed along the lines regarding a betterment of agriculture or a betterment of commerce or betterment of labor, but with the idea of making some of the baser metals, such as iron or lead, convertible into the rarer metals, such as silver or gold, and we know the many years of fruitless toil that were spent in the attempt to make this possible, and it been as fruitless a search as has been the search of modern men for perpetual motion.

Now in reading of ancient chemistry what little applied to agriculture, we find of course that a great deal of superstition had crept into the literature. For example, before the time of Nero there was such a thing as veterinary science. It was not known by that name, it was practiced by the alchemists, and I remember in reading in an old translation from the Latin of the remedy suggested by some of those ancient alchemists for the common disease of colic. They had colic in those times, it seems. The remedy applied to the horse or the cow was this: You lead the ox from the stable a certain distance and if in going this distance a duck or goose should cross the path, the animal will become immediately cured of the colic; but if it did not cure him, so says, the translation, "use salt petre." The alternate remedy was all right and I rather imagine that they mostly used salt petre.

But since those olden times we have discovered in the vicinity of eighty different elemental substances of which matter is composed. For example, any piece of material thing may be divided into one or more of eighty elemental substances. This paper that I have in my hand consists principally of three of those elemental substances,—carbon, hydrogen and oxygen combined in a certain definite proportion. The hydrogen and oxygen combined in a certain definite proportion. The hydrogen and oxygen in this piece of paper are combined in exactly the same proportion in which they are combined in water and this class of substances always has its hydrogen and oxygen combined in that proportion. It belongs to the same class of substances that the wood in this chair belongs to. It consists of carbon, hydrogen and oxygen, three materials. Carbon in its natural condition is a solid substance. Charcoal is one of the purest forms of carbon we have; the diamond is a still purer form of carbon and the carborundum, the manufactured article, is one of the purer forms of carbon.

United with that carbon in the paper, in the wood, in the starch,

in the granulated sugar, etc., are two other elemental substances, one of which is named hydrogen and the other named oxygen, and there is by volume just exactly twice as much hydrogen in all of these materials as there is oxygen; so the general formula, if I were to describe to you for this paper, would be carbon one part, hydrogen two parts, oxygen one part,  $C H^2 O$ , and that is exactly the same way in which it exists in the wood, in the building paper, in the sugar, in the starch, and in those various other ingredients which are commonly known in food chemistry as carbohydrates.

Now the union of the hydrogen and oxygen is the result of the life actively of a vegetable cell, which we will discuss briefly in a moment. With these three elements, carbon, hydrogen and oxygen, we have an element nitrogen which enters into animal and vegetable life. This is a gas and we have an element which is chlorine, which enters into animal and vegetable life, and that is a gas. Then we have phosphorus, which is a mineral, we have sodium, which is a mineral, we have silicon which is a mineral, magnesia and calcium; we have silver, gold, platinum and a multitude, nearly eighty in all, different elemental substances that go to make up the products of nature.

The effort of the alchemist was to change silver into gold, iron into silver or mercury into gold, and raise those baser products from a baser metal to the gold standard and he failed, and we have failed in that procedure up to the present time, although it has been continually tried from that time to this; but we have paid less attention in late years to the mere question of changing silver into gold and iron into silver, etc., the baser metals into rarer metals, because we have attacked the problems of life from an entirely different standpoint. We are not after curiosities in science in this age, we are trying to solve economical problems, and in the attempted solution of these economic problems we have accidentally hit on the problem that the alchemist has been seeking.

We have supposed that iron was an element indivisible, and we have taught in the schools, until recently, that iron is absolutely indivisible, that it is an element,—and if we look in the dictionary for the definition of element we will find it is the smallest collection of any one substance that can be gotten together. We have divided this element into two sets of materials, which we call atoms and molecules. We say "That is ground to atoms;" we mean by that that it has been ground to a point where it cannot be ground any further. Our dictionary definition of an atom is the smallest possible division of matter. Chemistry has enlinked itself in the last few years with physics and electricity more than it has ever done before, and the solution of chemical problems has been in a large measure the result of the application of electricity to the field. For instance, we dissolve a little common salt in water and it goes into solution instantly, and we dissolve a little lunar caustic (silver nitrate) in water and it goes into solution easily, and we use a little of the solution of the caustic with the solution of salt and those two substances, which are both perfectly soluble in water, when they unite, a dense white cloud, insoluble in water separates out. We have tried to explain why that happens but we do not know. We say it is because there is a reaction formed between the nitrate ion of the silver nitrate and the sodium ion of the salt, forming sodium nitrate, and of course you know that sodium nitrate is soluble in water. Then there

has been reaction formed between the chloride ion of the salt and the silver ion of the nitrate, forming chloride of silver, and that is insoluble in water; but now we know the reason that chloride of silver is insoluble, because it is a neutral solid and will not conduct a charge of electricity. If you take perfectly dry salt and attach two poles of the electric battery to that salt it is as good an insulator as is a piece of glass, absolutely dry salt, but let the least trace of water come in contact with that salt, so that it becomes a crystal, and there is no better conductor known than salt in solution. You take perfectly dry silver nitrate, attach the poles of an electric battery to it, it is just as perfectly a conductor as a piece of glass, but let a little water come in contact with it and it becomes an excellent conductor because it dissolved in the water the ions of silver and the nitrate ions became separated, by means of which they might migrate on each other, and they do migrate on each other according to the laws of attraction; but when you put a drop of silver nitrate into a drop of sodium chloride or salt, the combination between the silver and chloride will not conduct a charge of electricity because it will not disassociate, hence it goes out of solution and goes to the bottom, and the sodium nitrate does disassociate and does conduct a charge of electricity, does not go out of solution but remains in liquid form.

In studying the divisibility of matter, it has been taken up somewhat from this standpoint and we have brought electricity, with our especially sensitive electrical measurements, into play to help us tell whether or not we have the smallest possible division of matter at our command, and we have found that not only may the atom be divided but it may be divided into perhaps one thousand or more divisions, and that when we have it divided into one thousand divisions there is no difference; so far as we may observe, between the properties of those divisions, one of which is called an electrode. Consequently, we may divide an atom of hydrogen into one thousand divisions and an atom of oxygen into sixteen thousand divisions, because an atom of oxygen is sixteen times heavier than hydrogen. If that is true, the atom of hydrogen is made up of exactly the same class of material that the atom of oxygen is made up of, and the atom of sodium is made up entirely of the same class of material as the atom of hydrogen, and the atom of phosphorus is made up entirely of the same atom as hydrogen; in other words, all are made of electrons. If that is true, we have found that it is possible, from a scientific standpoint, to work back from the element and the atom itself into one uniform basis of matter, and the trend of scientific opinion at the present time seems to be that when we have examined all of the elements and all of the atoms we will find they all consist of electrons.

One thousand of those groups of electrons banded together, united together, form what we know as the atom of hydrogen, which has distinct properties of its own. Sixteen thousand of those same electrons banded together in another way and another manner form the element which we know as oxygen: Twenty-three thousand of those electrons banded together in this way forms an element that we know as sodium, the basis of our common salt. Fifty-six thousand of those electrons united together form the element of what we know to be iron, and so on through all the eighty odd elements.



Now there is a record of progress in the study of chemistry of matter. There was a poem written, by whom I do not remember, which says,

“When the world was formed and the morning stars  
Upon their paths were sent,  
The loftiest browed of the angels  
Was made the angel of discontent.”

and it is that spirit in man that is responsible for improvement and advancement in this study of life with the object in view, at the present time, of the betterment of the conditions of humanity.

Now, leaving that phase of the matter, which may or may not be interesting to you, I want to discuss briefly some of the more common and yet not well understood questions of ordinary daily life, nutrition. Most of us in a general way, some of us in a special way, know something of the process of nutrition in man and animals. They are essentially the same in both man and animals and I want to go over them briefly for a few moments.

The first step in the production of life is the utilization by the vegetable world of the mineral matter of the soil. Sugar is formed in the plant because of the presence of the mineral matter of the soil, but this mineral material acts more particularly, although not entirely of course, as tools of working utensils, by means of which nature forms these various compounds. Foods may be divided into organic food stuffs and inorganic food stuffs. The organic food stuffs consist more largely of gaseous elements of nature, together with carbon. The inorganic food stuffs consist more chiefly of the mineral elements which go to make up food.

Those two different compounds, the organic and inorganic compounds, are built up in the laboratory of nature in the plant out of the simple elemental substances and simple compounds in the soil. Those complex forms which are built by the plant out of the soil are then in a condition in which they may be utilized by animals, and it is quite well known that the animal kingdom cannot exist upon the elements from the soil in their mineral state exclusively. We exist on the same elements arranged in other compounds but we cannot exist on them in the form in which they exist in the soil, because our organism requires that it shall be gotten together into a more or less definite compound before it is of any value to our system. Consequently the animal body lives upon the organic food stuffs that are supplied by the plant, the sugar or starch, the albumen, the gluten of wheat, etc., and it requires a more or less definite proportion for the very best and most economical existence of the animal, of all of these various compounds, the sugars, starch, oil and protein compounds.

We find when the food stuff is introduced into the mouth of most animals that at the time mastication takes place in the mouth there is a secretion poured out freely upon this food stuff, which secretion we commonly know as saliva. This saliva has a two-fold purpose at least. First, possibly, for moistening the food that enters the mouth, and, second, for the treatment of it with an active digestive agent, which we have come to recognize as ptyalin, the active ferment of the salivary

glands of the mouth. The object of this ferment is to change the starchy parts in the mouth into sugar; the object of the change of starch into sugar as to get it so it can be dissolved by the body fluid. Starch is insoluble and if a person should introduce starch into his blood it would not be absorbed because it is not soluble, but sugar will be absorbed because it is soluble.

Nature does the same thing with the maple tree when in the spring of the year, in the manufacture of maple sap nature changes its starch into sugar, and we are enabled to get it in its passage up the tree to supply the leaves. Of course when it goes up the tree again it changes into starch because we do not find the sugar existing in any great quantity in the body of the tree or in the leaves.

The starch undergoes a partial change in the mouth, due to the moistening of the food, by which it is thoroughly mixed with this saliva by means of which a portion of the starch is changed into sugar; then it passes on into the stomach. The fore part of the stomach of the man acts very much in the same capacity that the first stomach does in the dairy cow. You remember that a dairy cow has four stomachs; man has only one but a dairy cow has four, and the first stomach of the dairy cow acts merely as a receptacle for the storing of the food; of course the dairy cow, the sheep and the goat eat fibrous food largely. That food is not fit to enter the stomach for the reason that it is not in condition to be absorbed, so it goes into the first stomach of the dairy cow and there it remains and softens in contact with the juice of the first stomach; then it is passed back again into the mouth; it is masticated into the mouth and then swallowed the second time, and this time it goes into the third stomach. The second stomach, of course, is to simply guard as a guard largely to prevent undesirable materials from going into the third stomach or final stomach. On the killing of a cow, for example, sometimes we find some very peculiar things in that second stomach. While I am speaking of that, I was in Chicago a year ago and visited Swift & Co's office, and saw there a group of curiosities that were taken from the stomachs of animals slaughtered there. I noticed one that was of special interest to me, taken from the second stomach of a cow. Evidently the cow had gotten hold of a whole paper of pins and had swallowed those pins, and while they were found in the stomach of the cow there seemed to be nothing abnormal about the cow. Those pins were all rolled together in a solid ball, packed like a snow ball; there was not a single pin in the paper that was straight, but they were all there in one solid ball.

The food is passed on then into the third stomach and into the fourth stomach where the gastric juice is secreted. In man this gastric juice is secreted in the lower end of the only stomach he has. In the upper end of this stomach there is but little acidity and there for a considerable time this starch conversion goes on, because of the presence of saliva, until a considerable portion of this starch is converted into sugar. Take a portion of starch in your mouth and hold it for a moment and you will notice it begins to taste sweet. You have only to hold it in your mouth a moment and it will taste sweet, due to the fact that the saliva has got in its action and that caused it to be converted into sugar.

Now there is practically no absorption that goes on in the mouth but when we get into the stomach there is an absorption of sugar and

protein material. As soon as milk, and material of that nature, reach the stomach, or shortly afterwards, the stomach begins to pour in a secretion of this gastric juice, which contains a considerable quantity of muriatic acid, about .2 per cent. If you add muriatic acid to milk outside the stomach, after a little time coagulation takes place, but this is hastened in the stomach because of the presence of special ferment very commonly known as the rennet ferment, otherwise known as pepsin. Sometimes we add a little pepsin in stomach trouble, showing that the glands of the stomach are not secreting the amount of rennet or pepsin that we think they should secrete.

The food is then passed on through the pyloric gate into the intestines. In the mouth we have had an alkaline media to work with, converting starches; in the stomach it is acid media in reaction, checking the conversion of starches that start in the mouth, but commencing the conversion of albumen; then when it gets beyond the pyloric gate or intestines the changes are continued that we started in the mouth, stopping those immediate changes that began in the stomach, but in the intestines we find a much more powerful ferment acting on these materials that were acted on in the stomach, but in this instance acting as an alkaline medium, and the bile is immediately poured into the food material so that portion is changed from acid to alkali reaction.

The greatest amount of digestion takes place in the intestines and it is possible, as has been shown in modern surgery, that many may exist without any stomach at all. Several operations have been performed, by means of which the stomach has been removed entirely due to disease, and the oesophagus attached right on to the intestines, and with a regulation diet the patient has succeeded in getting along quite comfortably. Most of the digestion takes place in the intestines. Another factor enters in here, that is a modern factor. The saliva of the mouth contains a great many bacterial organisms, in fact there are possibly 20 or 30 of them that have been isolated and they work in and around the teeth and flourish in the alkaline media in the mouth. When they get into the stomach of a normal healthy patient, they stop working quickly because the gastric juice is somewhat antiseptic and kills them; so with ordinary conditions, with food that is well chewed and held in the mouth for sometime, by means of which it is thoroughly mixed with saliva and there pulverized, it goes into a healthy stomach, and the length of time that it remains in the healthy stomach insures that it becomes sterile and the bacteria are killed, because the gastric juice in health contains, under normal conditions, with careful eating, destroys the bacteria. But when the food gets into the intestines it is again subject to the action of bacteria. Conditions here are favorable to bacterial life and it has been considered that some of those bacteria are very desirable in the breaking up of food materials in the intestines, but some are very undesirable at times and we find, due to a sluggish digestion sometimes, that some forms of these bacteria get an undue start on other forms, and we have intestinal disturbances which are undesirable, resulting in intoxication by absorption of poisonous by-products, as the doctor illustrated in her lecture on milk.

If we should examine under the slide of a microscope a drop of water from a stagnant pool, we would see many interesting forms of life. We might easily select a single cell organism, an amoeba for instance,

which seems to be a simple little mess of protoplasm working along in its channel of life in the drop of water. We might see it suddenly come in contact with a particle of material in the drop of water, remain there for a moment and pretty soon a little indentation will be seen in the edge of the little cell. We observe it closely for a moment. There is a fracture on that side of the cell and that little piece of material goes on the inside and the vent is closed. Soon there is a little swelling on the outside and something is pushed out, and the life action of that cell so far as that piece of food material is concerned is completed. It has met a piece of food material which is congenial to it and has absorbed it. This little single cell has no nerve structures whatever, neither has it eyes, nose nor ears, none of the common senses which we recognize, but it does have power to select its food. Let us further observe it as it passes along in its channel of life. It comes in contact with another piece of material. It remains in contact with it for a moment, then bounds away like a rubber ball. In that brief moment of contact it has found that this second particle of material is not congenial to its structure, and consequently does not take it in as food. That single one celled body under its exceedingly peculiar and restricted environment, without any of the ordinary senses such as we know, has shown with what facility and intelligence, if you will, it selects its food, according to what impulse we of course do not know. It may be electrical or chemical, but whatever impulse, it is intelligently controlled by this, the simplest of organisms known. We do know if we put a drop of caustic or poisonous material in the path of this single body, that it will fight it off as long as possible.

Right along the intestinal canal of man, who is embodied with greater variety of movement, intellect and motion, man who has the five senses by which he may select his food, feeling, hearing, tasting and smelling and seeing, all along the intestinal canal of man range these single one cell bodies, and when man, because of that greater variety of movement and environment, compels his food to pass down through his system, before it passes into his system in any way whatsoever, it passes the examination of those little single cells that guard his intestinal canal; if it is suitable to them they pass it in, if it is not suitable they reject it. Now man, with all his wisdom, continually forces on those little one cell guards—policemen of the animal body, as they are material that is to them unwholesome, until at last worn out by the fight against hopeless odds, they relax their vigilance and this poison filters through and comes in contact with the sensitive protoplasm within, causing poisoning. Does it not seem as though man, with his great variety of movement and intellect, ought to use enough care in the food that he passes before those little guards of his, so that he gives the kind of food that is palatable, and nourishing to those cells, instead of continually forcing upon them something that by every visible warning they can give to him they are telling him is unwholesome, and warning him to fight it off.

Now in the blood of man are another specie of cells which are carrying on this same warfare, and this brings up the modern theory of the disease. A disease attacks the animal body and the little bacteria, the pathogenic bacteria, gets his hold in the life blood of the animal, due to inoculation or infection. There flocks immediately to that point

a host of defenders of that animal's life and they circle around that intruder and speedily, with just as much energy and just as naturally as one enemy attacks another, they strive for the mastery of that invader. If a man's life has been a wholesome one, if he is a healthy individual, by means of which he has built up a strong army of defenders in his blood, the chances are that most any disease, if he takes it in time, can be beaten off; but if he is in a run down condition, if he has continually permitted to enter into his system those materials which are unwholesome, if by some other cause for which he may not be perhaps directly responsible this condition exists, then he has not the vigilant guards in sufficient quantity to overcome the intruder. The modern theory of prevention of disease is right along this line and I will touch upon it just a moment.

There has been a good deal of prejudice throughout the country for sometime to some of the modern methods of fighting disease. Very frequently you hear it said "I do not believe in this vaccination theory at all," but the vaccination theory is here to stay and it is founded on a reason, which I think possibly in a crude way I can explain to you. There comes a time in the progress of diptheria or smallpox when if the patient has sufficient vitality so he can get past a certain point he will get better. We all recognize that. The physicians used to tell us "If we can keep him right until the ninth day he will get better." We recognize that ninth day or third day, I am not a physician and cannot speak correctly of this period of time. Why is that? We get to the third or ninth day and this contagious disease or infectious disease has undergone a gradual growth. Of course these one cell bodies take food and they excrete material. After they have developed for a certain length of time, by means of which they have excreted a certain quantity of product, they are rendered inactive, because of the toxicity of this excrement or material they have excreted to their bodies. If it is the bacillus causing diptheria, at the end of a certain number of days, in the natural progress of that disease, they have accumulated in the blood of that patient enough excrement which is toxic to life of that germ so it kills the germ, and *if the patient has vitality* enough to live that length of time, he will get well because the disease will kill itself. The same way with smallpox.

The bacteriologists have said "If that is true, can I not artificially produce that disease in an animal and let it run its course until it gets to a point where it has accumulated enough excrement so it will kill itself, then take the serum from that animal with that excrement matter in it and in the beginning of this disease inject it into the veins of the patient, and put at the beginning of the disease the material in the arteries of that patient that is toxic to that germ?"

That is the theory of vaccination. We have made a few mistakes in vaccination. Poor culture methods have been followed so impure cultures have been obtained, and there have been some undesirable results, but pure cultures are now obtained and vaccination is a success. It is proved to be and is the proper way to stamp out diptheria and smallpox. The reason we have not been able to do that with tuberculosis is because there seems to be no period in the progress of the disease of tuberculosis when it has reached its height. It reaches the height with the death of the patient, and the excrement matter of the

life action of the tubercule bacillus is not toxic, or does not seem to be toxic to the bacillus causing tuberculosis, consequently we have been unable to inject into the artery of the patient any of the serum from the tubercular patient or animal, which in any way checks the disease of tuberculosis; but we have awakened now to the fact that taken at the proper time and properly diagnosed to begin with, a patient with ordinary vitality has a fighting chance and a good chance for life with tuberculosis, and it is a sanitary measure. The method of fighting it is pure air and pure sunlight; and the method of fighting tuberculosis in our dairy stock is with pure air and sunshine.

I think, Mr. President, I have taken up sufficient time.

The Chairman: Would anyone care to ask Dr. Robinson any questions about this? There is one thing I do not just understand. We are told by scientists that if we eat foods containing certain bacteria those bacteria in the alimentary canal may have the power of killing off the death producing bacteria and in that way keep us healthier and stronger. You say that where there are bacteria in the mouth and in the saliva when that food goes in the stomach the bacteria are all killed off and there goes into the intestines a sterile food how can, taking lactic acid bacteria as they do in this life giving juice made out of milk, how is that going to affect the bacteria in the alimentary canal?

Dr. Robinson: The reason of this is the lactic acid bacteria is spor bearing and while the lactic acid bacteria may be killed in the stomach the spores are not killed but developed in the intestines.

The Chairman: Would anyone else like to ask Dr. Robinson any questions on the subject? Of course it is rather scientific to us ordinary people but the only way to understand it is to keep studying and asking questions when we do not understand.

Music by Miss Barnes and Mrs. Brown.

The Chairman: We will now have the pleasure of listening to Prof. Ivan C. Weld, of the Dairy Division of the Department of Agriculture of the United States, talk to us on Sanitary Milk Supply.

## MILK AND CREAM CONTESTS AND A REPORT OF THE SCORING IN MARKET MILK AND CREAM CLASSES.

IVAN C. WELD, DAIRY DIVISION U. S. DEPT. OF AGRICULTURE, WASHINGTON.  
D. C.

The judging or scoring of milk or cream is a study of those products not only from a chemical and bacteriological standpoint, but from the standpoint of flavor and freedom from foreign matter. Certain definite mathematical values are given Flavor, Composition, Bacteria, Acidity and Appearance of Package and Contents. Each of the foregoing conditions are examined and rated according to their merits on a score card and such ratings when added, constitute the score of the

milk sample under consideration—one hundred points constituting a perfect score.

#### FLAVOR.

*(Forty out of one hundred points.)*

The palatability of any food is said to have much to do with its usefulness in nourishing the body. This may be due in part to the increased flow of saliva which is stimulated by a particularly palatable food. The flavor and odor of milk it may be said is that peculiar property which acting on the organs of taste and smell creates in the mind of individuals a degree of satisfaction or disgust. In a way it may be said that the cleaner milk has the better flavor. This brings us to a consideration of the conditions commonly affecting the flavor of milk and cream, namely: (1) changes in flavor due to the physical condition of one or more cows in the herd. (2) Changes in flavor due to one or more cows in the herd eating strongly flavored food. (3) Changes in flavor due to the absorption of various odors in the atmosphere where milking is done or milk is stored. (4) Changes in flavor due to bacterial infection and the development of bacteria in the milk.

While there is sometimes a combination of defective flavors, any one of which it is impossible to recognize, an experienced person will yet be able to judge the general quality of flavors and odors. In many cases distinct flavors and odors, if present, can be definitely recognized by specially trained men.

#### COMPOSITION.

*(Twenty-five out of one hundred points.)*

About 47 quarts of cow's milk will weigh 100 pounds. Of this amount 87 pounds is water, 4.95 pounds sugar, four pounds fat, 2.6 pounds casein, .7 pound albumin, .75 ash. These are average figures and if the composition of a cow's milk was never subject to natural causes for variations in composition one of the somewhat troublesome questions of the past, present and future milk supply would have been entirely eliminated. But the natural composition of milk is variable. The percentage of milk solids and water varies not only among different species of mammalia but also among different breeds of cattle and among different cows of the same breed. Some of the widest variations in composition may also be found in the milk produced by the same cow at different periods.

In view of the constantly changing percentages of milk solids, and also in view of the fact that milk is readily adulterated without materially changing its appearance, and furthermore in view of the fact that consumers cannot judge for themselves regarding its quality it long ago became necessary for the several states and cities to establish certain arbitrary standards for fats and solids in milk, and below which milk should not be sold. These standards vary in different states as for instance in some states a standard for 11.5 per cent total solids is the minimum, while in others 13 per cent milk solids is required. In still others a double standard is maintained which allows a lower per cent of milk solids in summer than during the winter months.

While in a few isolated cases the standards seem to be rather high and therefore subject to well deserved criticism, in other places they are so low as to admit of skillful adulteration of normal milk, which even then meet every requirement of the local low standard. From the abundant evidence available I believe the consumer of milk can reasonably demand a milk that will contain not less than 3.25 per cent fat, or 8.5 per cent solids not fat and a milk in which fats and solids not fat combined, shall equal at least 12 per cent total milk solids.

To be sure, individual cows have been bred to produce an enormous flow of milk that will not normally contain so much as 12 per cent solids. These same selected cows can also be so bred that their progeny will in turn give even a greater amount of still thinner milk. It thus becomes possible by following a certain line of breeding to accomplish in that way precisely what has sometimes been accomplished by using the pump. Either practice, however, leads to the same result and an arbitrary standard for fats and solids not fat in market milk, long has been, and doubtless long will continue to be the surest safeguard not only to the consumer of milk, but for the honest producer and distributor of milk as well.

The percentage of fats in milk and cream is determined by the well known Babcock method. Knowing the percent of fat the solids not fat may be most conveniently estimated by (1) determining the specific gravity of the milk, (2) by the use of a short rule viz: To find the per cent of solids not fat in milk, add two-tenths of the per cent of fat to one-fourth of the lactometer reading.

#### BACTERIA.

*(Twenty out of one hundred points).*

While certain forms of bacteria may be useful in the manufacture of butter and cheese, we may safely conclude that so far as market milk and cream is concerned the fewer germs of any kind contained in these products the better for all concerned.

While milk in the udder of a healthy cow *may* contain bacteria, practically all contamination takes place after the milk leaves the cow's udder. The extent of the contamination depends almost entirely upon the conditions under which the milk is secured and handled. Clean milk can only be secured by clean milkers who use clean utensils and who do their work under clean cows and in a clean atmosphere. There are various ways by which cleanliness may be secured. The expense of cleanliness need not be great, but the absence of it may be and sometimes is most damaging to a dairyman, and to a community.

Basing my opinion upon the work of many clean and successful dairy-men I believe a *perfect* certified milk should not contain over one thousand bacteria per cubic centimeter. I also believe that a *perfect* market milk should not contain over ten thousand bacteria per cubic centimeter. Milks and creams containing bacteria in excess of the above mentioned standards are scored according to the conditions found (see score card for milk) but no certified milk containing over forty thousand bacteria, and no market milk containing over five hundred thousand bacteria per cubic centimeter should be entitled to a single point on the score card.



The number of bacteria in milk or cream may be determined in the following manner:

The bottle of milk is vigorously shaken so a fair sample can be secured. 1 c. c. pipette (sterilized) is filled and the sample is transferred to a flask containing 99 c. c. of sterilized water. (The milk is then diluted 100 times). A definite amount of milk thus diluted (1-10 c. c. or 1 c. c.) is then transferred to a sterilized petri dish. To the diluted milk is added a culture media (2 per cent lactose agar) melted or in a liquid condition. The diluted milk and culture media are well mixed. The culture media solidifies as its temperature lowers and each individual germ is made stationery in the solidified jelly. The dishes and contents (milk and culture media) are then placed in an incubating oven at about 98°-100° F. where for two days the germs are allowed to grow. At the end of that time each original germ will have multiplied a sufficient number of times to form a colony large enough to be seen with the naked eye. By the aid of specially devised apparatus the colonies are counted. The necessary calculations are made (according to the dilution of the milk sample) and the total number of germs originally in the milk is known.

#### ACIDITY.

*(Five out of one hundred points).*

It seems to be a well established fact among authorities that acids other than lactic acid are present in newly drawn milk. Any increase in the total amount of acid over that originally present in milk is due to the formation of lactic acid. According to the best authorities the formation of lactic acid in milk is the result of the presence and activity of bacteria. It has been demonstrated that when the total acid amounts to as much as .20 per cent that the lactic acid producing bacteria have usually increased sufficiently to have become thoroughly established in the milk, and, in such a case, under fairly favorable conditions will soon render the milk sour and unmarketable. We can therefore understand the desirability of knowing, definitely, the amount or degree of acidity in the samples submitted in competition. The acidity of milk or cream is usually determined by titration. A given quantity of milk or cream, say 50 cubic centimeters, is treated with a few drops of phenolphthalein, a chemical which in an acid solution is colorless like water but which in an alkaline solution is red. To the 50 c. c. of milk containing this chemical is added a sufficient amount of one-tenth normal alkali to neutralize the acid, when the milk or cream will be changed to a light pink color. The amount of alkali required to do this is carefully noted. As one cubic centimeter of one-tenth normal alkali will neutralize .009 gram of acid the pre cent of acid is determined by multiplying the number of cubic centimeters of alkali required by .009, dividing the result by 50 or the number of cubic centimeters of milk or cream used and then multiplying the product by 100. Hence we know that one sample of milk may contain .16 per cent acid while another may contain .28 per cent.

## PACKAGE.

*(Ten out of one hundred points).*

Since the practice of dipping milk from open cans on the street is highly objectionable, and the drawing of milk through a faucet from cans in the delivery wagon is an equally bad practice, we find it necessary to make use of some small package well adapted to delivering milk to the retail trade. During the past few years several new packages have appeared on the market and attracted more or less attention. Some of the packages have been constructed entirely of paper and some of paper and tin. In many cases packages of this class are very useful for grocery and market men who retail molasses, vinegar, kerosene, oysters, etc. In a limited way they are also well adapted for distributing hot coffee or milk to city laborers who are dependent on lunch rooms and restaurants for food supplies. In a small way such packages are also useful in retailing milk over the counter of the city milk plant, but experience has taught dairymen who have tried to use such packages in their regular retail wagon business that they are usually unsatisfactory in several important respects. As yet we have found no package that for attractiveness and general desirability can compare with the plain glass bottle. A retail package for milk should be free from metal or rubber parts. It should be so constructed as to enable rapid and thorough cleaning. The sterilizing of bottles used in the retail trade is particularly desirable and is not difficult to accomplish. For a long time it has been considered a bad practice to place "New wine in old bottles." In this day and generation we should be particularly careful not to place clean new milk in bottles that are in any way unattractive or unclean. We must at first please the consumer's eye by showing him a clean, attractive package, entirely free from sediment or foreign matter. The milk must be well protected by a tight-fitting bottle cap. If a little boiling-hot paraffin is poured on the top of the cap after it is in place it enters into every little crack and opening and effectually seals the bottle making it practically air tight. The paraffin also protects the cap and the milk as well, from the hands of the dairyman, and from dust, rain, or mud. Another thing that helps to protect the cap and also the milk is a parchment paper covering for the top of the bottle. A paper covering is less expensive than metal and answers practically every purpose. Such a covering may be used either with or without the paraffin above mentioned. It affords additional protection to the milk and is especially desirable when bottles of milk are to be packed in crushed ice for shipment or for delivery.

It will be observed that a milk and cream contest systematizes and makes possible a study, in details, of the various influences affecting the milk and cream supply.

MICHIGAN STATE DAIRYMEN'S ASSOCIATION, GRAND RAPIDS, FEBRUARY 17-19, 1909.  
COMPOSITION, CONDITION AND SCORE OF MARKET MILK.

No.	Name.	Place.	Fat. %	Sol. not fat. %	Acidity. %	Total bact. per cc.	Score for.					
							Flavor.	Compo- sition.	Bacteria.	Acidity.	Pkg.	Total.
							40.	25.	20.	5.	10.	100.
1	Curtis & Curtis	Lyons, Mich.	4.25	9.40	.20	34,300	35	25	18	5	8.5	91.5
2	J. J. Lawson & Sons	Deerfield, Mich.	3.90	8.75	.19	830,000	34	24	0	5	8.0	71.0
3	H. B. Wattles	Troy, Mich.	5.15	9.53	.20	76,000	34.5	25	16	5	9.0	89.5
5	H. F. Probert	Jackson, Mich.	4.70	9.44	.20	1,000	34	25	20	5	9.0	93.1a
4	Fremont Creamery Co.	Fremont, Mich.	4.20	8.94	.28	3,575,000	25	25	0	0	1.50	92.24
6	Leavenworth Bros.	Grand Rapids, Mich.	4.25	8.95	.20	16,000	34	25	19	5	9.0	92.2d

Highest score and first prize won by H. F. Probert, Jackson.

Second score and second prize won by Leavenworth Bros., Grand Rapids.

COMPOSITION, CONDITION AND SCORE OF MARKET CREAM.

51	Curtis & Curtis	Lyons, Mich.	27.75	.162	14,000	36	25	19	5	9.5	94.5
52	H. B. Wattles	Troy, Mich.	28.25	.162	9,000	36	25	20	5	9.5	95.5 2d
53	H. F. Probert	Jackson, Mich.	32.00	.18	5,200	35	25	20	5	10	95.0
54	Leavenworth Bros.	Grand Rapids, Mich.	21.00	.189	4,600	36.5	25	20	5	9.5	96.0 1st

Highest score and first prize won by Leavenworth Bros., Grand Rapids.

Second score and second prize won by H. B. Wattles, Troy.

Meeting adjourned until 10 o'clock Friday morning.

## FRIDAY MORNING SESSION.

Meeting called to order at 10:30 A. M. by President Wm. Grant.

The Chairman: The first in order will be the appointing of the auditing committee. This committee will consist of Messrs. Frank Sauer, Geo. Robinson, Dan McMullen.

The Chairman: State Dairy and Auxiliary Associations was to have been discussed yesterday by Mr. S. E. Wilson, Secretary of the Dairy-men's Association, but in his absence will be handled by Mr. Lillie.

## STATE DAIRY AND AUXILIARY ASSOCIATIONS.

MR. COLON C. LILLIE, COOPERSVILLE.

Mr. Chairman, Ladies and Gentlemen:

Up to four years ago our State Dairymen's Association was largely a buttermakers and cheesemakers association. We had one annual meeting and the energy of the Association was devoted largely to those two enterprises. It was proper because we could not get the dairy farmers of this state to take very much interest in the annual meeting.

It can be readily seen that to have a successful state association and an exhibit of dairy supplies and machinery that we have to make a special effort to get the buttermakers and creamery managers and cheesemakers there to interest the supply men, and that the effort of the association was largely devoted to those interests.

Some four years ago we conceived the idea if we were going to have this association do as much good as it might and ought to do that we ought to make an attempt to interest the dairy farmer, and so I got a resolution through the association when it met in Grand Rapids, authorizing the holding of auxiliary meetings at least in different portions of the state each year.

When we began to hold these auxiliary meetings we naturally found that it would be a good deal better if there was a local dairy organization in the community in which the auxiliary meeting was held. For instance, the people down at some little town, at Coopersville, for instance wanted a meeting of the State Dairymen's Association. There was no organization there to make arrangements for it and one or two enterprising men had to do all the work. They had to do all the advertising, make arrangements for a hall, and that sort of thing, so we saw if we only had a local organization that these auxiliary meetings might be made much more successful. Two years ago, at Battle Creek, I recommended in my annual address to the association that counties form County Dairymen's Associations, local organizations, not, you understand, entirely for the purpose of furnishing the means of better holding of auxiliary meetings, but because every county needs an or-

ganization, a local dairy organization. Then if we are going to do this there ought to be some plan whereby the local association can affiliate with the state association. This is very nicely illustrated in your Grand Traverse Association. The Grand Traverse Association has been in existence a number of years and you have had some successful meetings, but when it comes to keeping a record of those meetings and when it comes to getting those records published in book form so they can be preserved, you find it is too expensive for a local organization, you have to have the state back of you in order to do it. All the meetings you have held up here, when you have held them alone, you have no record of. It costs money to get not only the stenographic report but after you get that report it costs a great deal more money to get that report published in book form. The state association has the privilege of getting dairy reports published by the state public printers. Of course the local associations cannot do that, so you can see the advantage of having local associations and having some plan so they can affiliate with the state association.

A year ago a committee of the state dairymen's association was appointed to devise some means whereby this might be brought about, and at Grand Rapids in February last this committee reported, and their report was to the effect that where a local association existed, if each number of that local association would pay fifty cents to the state association they would be entitled to all the privileges of the state association. The annual fee for a member of the state association direct is \$1.00. That makes any person a member but it was clearly understood that there must be some fee that would go to the local association to help keep up that organization. Ordinarily the local association would have to provide the hall for the meeting and the joint meeting of the state association and the local association. Up here you use your county building and it does not cost you anything but you have postage and other expenses that have to be defrayed, and so there ought to be a membership fee in the local association as well as in the state association. That is a matter, however, that you are to settle for yourselves but that is the idea, that a local association that will pay over to the state association fifty cents a member will be entitled to an auxiliary meeting, the benefits of the stenographic report and the publication of the annual report of the state association, which not only gives the report of the auxiliary meetings held in that section but all of the auxiliary meetings held during the year and of the state meeting. That briefly is the gist of it. I think you can see the importance of local associations. I would not encourage a county to form a local association just for the purpose of having an auxiliary meeting once in a while, but I believe thoroughly in the local associations. You ought to meet several times during the year and discuss dairy problems, have local programs and you can once in a while get a dairyman from the outside to have a little variety to your topics, but what you need is to get together yourselves and come up against these things, exchange ideas and create enthusiasm in the business; then when you can get the state association to hold an auxiliary meeting in connection with your association you will have all the advantages that the state association has, and you will get the annual report by paying fifty cents to the

state association instead of \$1.00, which you would have to do if you did not have the local association. Therefore it seems to me that the Grand Traverse Association ought to be interested in this question of becoming affiliated with the state association. It is a good thing for the state association and for the local associations.

#### DISCUSSION.

Mr. Leshar: I would like to ask a question. I saw men out there taking in money and I supposed that meant for me, so I contributed my fifty cents to this association, but you have just referred to what I have come here to say. While we could not maintain a strong organization at Mancelona, I think I can get two counties holding meetings alternately. Having the local meetings without connection with the state meeting is the idea and then once in a while we are entitled to an auxiliary meeting. If you have any faith in my ability to set the ball rolling, all I want to know is what I have to do to start such an organization. I think this will just catch the idea exactly so I can work on our people and Heaven knows if anybody needs it we do.

The Chairman: All you have to do is to perfect your local organization and send a list of your members to Mr. Wilson, the secretary of the State Dairymen's Association, also your fee. Fifty cents entitles every member to the published report, so you get recognition by the state association as a definite organization.

Member: Does that entitle the ladies to send butter to the annual meetings?

Mr. Lillie: Yes, you may send butter to all the exhibits.

The Chairman: The book alone is worth \$1.50.

Mr. Leshar: I have two and I would not part with them for \$25 if I could not replace them.

Mr. Harris: I do not think we are entitled to send our butter, I think the local association is entitled to two delegates.

The Chairman: We take the president's word for it. As I understand it a member of any auxiliary association may send his butter down there if he is in good standing, and he is entitled to compete for prizes. That ought to be the way to have it arranged and if it is not we can easily fix it, for we want to encourage the exhibit of butter.

Mr. Leshar: My paying this fee here entitles me to this book now?

Mr. Lillie: If you are a member of this association you are entitled to the book.

The Chairman: If there is nothing further on this subject, we will pass on to the next topic, Cow Testing Associations by Mr. Lillie.

## COW TESTING AND KINDRED ASSOCIATIONS.

MR. COLON C. LILLIE, PRES. MICHIGAN DAIRYMEN'S ASSOCIATION.

Mr. Chairman, Ladies and Gentlemen:

A cow testing association is simply a local organization for the purpose of determining the economical production of each cow in the herd. The three great factors in the development of the dairy cow are first selection, second breeding and third feeding. These are the three great factors. Every man who has developed an animal to be superior to its ancestors has had to take into consideration these three factors,—first, selection; second, breeding; and third, feeding.

If you ask me which is the most important of these three factors I can simply answer and say to you that you can ignore no one of them. They are all important. At the meeting at Cranston, in Oceana County, the other day in the question box a man asked this question: "Which is the more important, corn silage or clover hay?" I answered that myself in this way, "In constructing a house, which is the more important a door or a window?" They are both important and so in proper feeding to get the most out of it we have to have corn silage and clover hay, and in developing the dairy cow we must consider all these three things,—selection, breeding and feeding.

Mr. Raven talked to you yesterday about breeding, and our state experiment station is doing a wonderful work in arousing the enthusiasm of the farmers of this state along the line of breeding better cattle. They are organizing cooperative breeding associations where they try to get the people in a community to unite together in an organization to breed up not only the dairy cattle but the beef cattle; but they are not doing very much in the organization of beef breeding associations because, as Mr. Raven told you yesterday, there is greater interest being taken at the present time in dairying than in the production of beef.

The next question that comes is this selection and then I have another topic here on the program; the question of feeding. The way it was arranged on the program, the way it has come out has been very logical, we have breeding first, that is the second consideration, I am to talk on selection and then on feeding. The logical order of the thing is selection, breeding and then feeding. There is no use in breeding worthless cows to improve your dairy stock. Get rid of the worthless cows, select the good ones and they try and improve them by better breeding.

The object of the test association is selection. Just as long as you have had dairy cows you have been trying to select the best dairy cow by her looks, by her form, by her conformation. There is a great deal in that and yet we cannot select the most valuable economical producers by the conformation of the animal or by the looks of the animal. We can easily select in one class the animals of beef type and in another class the animals of dairy type, but we find there are many dairy animals that are not as profitable as we would like to have them and it is on the selection of the profitable dairy animals from the unprofit-

able ones that depends upon the dairyman. It is his problem to solve.

There are three things that must be taken into consideration in ascertaining the profitableness of a dairy cow. First the amount of milk she gives in a year, not what she gives in six days, seven days or thirty days because you want to keep the cow a year. The second is the quality of that milk and percent of butterfat, and the third is the cost of feed. These are the three things. If you know these things about the dairy cow you can determine her value as a business proposition and of course when you consider her as a business proposition you throw sentiment aside and figure the dairy cow as a milk producing machine.

Then the only way to determine the value of the dairy cow as a business proposition is to keep a record of the performance of that cow. You can guess about it and you can say she has a high nervous organization, that she has wonderful development of the spinal column, has high pelvic arch, that she has a dairy form and that sort of thing, but that does not sell the dairy cow today. The man has to know what she will do at the milk pail, that is the final test of the dairy cow today. "How does she produce." How much does she produce and how much does it cost to produce? That is what they want to know. The various pure bred associations have come to this conclusion themselves, for their private records they have made not taking into consideration the cost, do not help them very much in selling their animals today. They have to have good records, authentic records, and they have to take into consideration the cost of production as well as production, because it does not matter so much to a farmer that he has a cow that gives a wonderful flow of milk or yield of butterfat. The real economical question with the farmer is "How much profit do I get out of that cow?" Take a business man, he is not so interested in doing a great business if he does not get any profit out of it. He is better satisfied and it is a good deal better business to have a moderate business and make a good profit than to do a large business and make no profit. So an animal that will give a wonderful yield of milk or butterfat, but consumes so much food in doing that that there is no profit in it, is not a good dairy animal.

The object of the cow testing association is to determine that economical production. What is a cow testing association? It is simply a local organization of the dairymen of a community for the purpose of keeping records of each individual cow in the various herds. This idea originated in Denmark several years ago. In this country we farmers have all acted as individuals and we have not acted through organization. One reason, I think, why the Denmark farmers organized for the purpose of keeping records of their cows was because they did not have as cheap an investment to test their butterfat as the American farmers. Dr. Babcock invented a machine, the Babcock test, which makes it very easy to determine the butter fat a cow yields in a year. He did not get the machine patented, he believed the result of his labor ought to go to the people and he knew they needed it, and so we have had a wonderful machine, so far as the dairyman is concerned, that any firm has a right to manufacture and put on the market without paying any royalty upon it. In Denmark the invention was a more complicated



machine and a much more expensive one. While ours costs a few dollars their's cost \$75 or \$100, and a single Danish farmer thought he could not afford a machine like that for testing his cows so he organized his neighbors into an association and they bought one of those machines and hired a man to go from farm to farm and do this business.

We had a cheap machine and tried to do this individually in our own herds and we failed utterly as a people. That is an illustration of what organization can do for farmers. It is not because we do not realize the importance of doing this but because we as American farmers will not take the time and will not keep the records. Then again, here comes those stigmas against private records. A man comes to me and wants to buy an animal for breeding purposes and wants to know the production of that animal. I say "She produced so much the past year and it cost us so much to keep her." He wants to know who kept the records; if I am responsible for them or a man in my employ is responsible for them he looks on those records with doubt, I do not care who the man is. If a disinterested man comes to my place and keeps the records of those cows then the buyer will believe that record is correct. There is reason for this because we know private tests have been padded. A great many breeders have padded private tests for the purpose of getting an extra price for breeding animals so it has brought us where we have to have records which will place ourselves beyond the reproach so there is no question about the records of our animals.

The common farmer has not time to do this, he has not time, at any rate he does not do it. We have advocated the use of the Babcock test and scales for every dairyman in the state of Michigan ever since the Babcock test was invented, and yet how many men in Michigan keep a private record of their cows? You can count them on the fingers of one hand in almost any community, and in some communities you do not have to have a single finger.

At a meeting in south Ottawa county a short time ago the hall was crowded with people and I asked how many in the hall owned Babcock testers and three men held up their hands. Then I asked how many of those three used the tester at the present time and not one man held up his hand. A good old Dutch farmer sat on the front seat with a smile on his face and I asked "Where is your tester?" He said "It is up in the garret. The boy went to the agricultural college and took the short course in dairying and became enthusiastic over this question of testing cows. He came back and wanted a Babcock test and scales and everything, and I got them for him. I saw he was right, and through that winter and early spring we did that work, weighed each cow's milk separately tested the milk, etc., and kept the records; but in the rush of spring work and in making the harvest we worked so hard that when it came time to test the cows we did not do it and let it go." That is the way a farmer does things, is it not? It is not because the farmers do not realize that they ought to do this but because they certainly do not seem to have time at all seasons of the year to do this work, and they cannot do it.

When you organize a cow testing association then you hire a man to do that work for you; it is his business to do that and nothing

else, and when a farmer hires a man and pays him for doing a certain thing he is going to see that he does it; consequently that work is done and is done carefully.

The state dairy and food department became very much interested in this cooperative cow testing association largely because we had a young Dane as a dairy and food inspector. Michigan was the first state to take up this idea of cooperative cow testing associations, and I say it came from the fact that we had a young man as a member of our force who was born and brought up on a Danish dairy farm. His father belonged to a cow testing association and he had done the work in a cow testing association. He was interested in dairying and he had made himself conversant with the results of the cow testing associations in Denmark. He enthused us with this idea and he became interested and organized the first cooperative cow testing association in the United States at Fremont, in the county of Newaygo, four years ago. That is also where we held the first auxiliary meeting of the Michigan Dairymen's Association four years ago last August. I explained the object of the cow testing association the same way as I am doing here today and it took. Mr. Rozema up there said, "I believe it is just the thing, I believe we can form an association here." I said, "You look the thing over and if you think there is any chance for it I will send Mr. Rabild up here to help you organize." It was only a little while before we got a letter from Mr. Rozema saying they could form an organization and Mr. Rabild went up there and formed the first association. He found a young Dane willing to do the work in the association for a dollar a cow per year. We ought to have started out with the idea of paying \$1.50 a cow and we could have organized as well because it is difficult to get plenty of men to work for a dollar a cow. Rabild did not understand the conditions of common labor in this country compared with Denmark; that would be pretty good wages in Denmark but in this country it does not amount to much. We organized this association and he obtained this experienced man who operated a cow testing association to come over here and do this work, and at the end of the year we published the record. I have a bulletin here. We had thirty thousand of these published and distributed throughout the state of Michigan. This is a picture of the man, Mr. Munson, who did the work there; his paraphenelia is in the farmer's kitchen; he is testing the milk.

What is the actual work of this man? He comes to my house say this afternoon; sees the cows milked tonight, weighs the milk himself, takes a sample of that milk, sees the cows fed, weighs the feed that is being given to the cows. Tomorrow morning he does the same thing. Then he has a sample of the night's and morning's milk; he tests that milk and figures out the yield of butterfat, charging the cow with her ration at the market price and giving her credit for the butterfat at the market price, and makes a record of each cow in the herd. When he is through the farmer hitches up and takes him and his tester to the next farm, where he repeats the operation. The idea is you have to have twenty-six herds in a cow testing association so there will be a herd for each day in the month, so he only goes to a farm one day in a month. A man will say first "That is not often enough to know very

much about it." The Danish government has figured on that carefully. It is not practical to do it any oftener; if it were we would do it oftener, but it makes it cost too much, and the Danish government has figured that if a cow is tested one day in each month through the entire year the actual results can be obtained within 4 per cent. That is close enough, it is approximately correct. You know that when a cow comes fresh she gives a larger flow of milk than she does at any other time. She naturally falls off in her milk gradually until from natural causes she becomes dry, and she repeats that process every year. If we get a check on her regularly every month during the year it is approximately correct. I figured that out a number of years ago. It was right after the Chicago World's Fair, about the time that I became interested in making individual records of my cows. We had not weighed the milk much up to that time. I thought at that time we could not afford to have the men weigh the milk night and morning for each individual cow, so we weighed it one day in each week. I took the records of the Chicago Fair, took the cow's record, where the milk was weighed and tested every single day during the entire period of that dairy test over there. Take Thursday in each week for instance, then get the yield of milk and the butterfat every Thursday, and multiply it by seven to get it for every week and go on with every week in the year and get your results; then add the actual figures as they were there and you will find there was little difference. The results are near enough for any ordinary purpose. I do not claim they are absolutely correct but are they a close approximation.

We here in Michigan created so much comment about cow testing associations and made a little success of it, that Chief Webster, of the Dairy Division of the Department of Agriculture, asked Mr. Rabild to become affiliated with the Dairy Division of the Department of Agriculture for the purpose of organizing cow testing associations in other states in the Union, because he could readily see that was at the basis of improvement in dairying so he got Mr. Rabild away from us. The Dairy Division questioned whether testing once a month was often enough so we knew anything about the cow when we got through, and they sent Mr. Rabild to Minnesota to make an investigation. Professor Haecker, of the Minnesota Agricultural College, has the actual weight of each milking, night and morning, for the college herd of cows for the last ten years, and also the test; every milking was weighed and tested and the record kept for each cow. Those are the most careful records we have in this country, they cover a longer period of time. Mr. Rabild went there, and took the actual weight and actual test of a certain cow for the period of ten years. Then he took the 15th of January, the 15th of March, the 15th of February, etc., of each year, right through the year, one year with another, estimating two weeks back and two weeks ahead to get the weight and butterfat. He figured it for a number of years and then compared the actual weight and test; in one instance there was one-tenth of one pound difference, so that the Dairy Division of the Department of Agriculture was satisfied that monthly records of cows, if taken year after year, were a very close approximation of the actual yield of cows.

The official tester goes to each farm once a month and figures this out

for each cow, leaves a copy of his figures for the farmer and at the end of the year leaves a record for the entire herd for the year, so you can find what each cow in your herd has been producing and what it costs to produce it. That places dairying on a business basis. You know exactly what you are doing.

If you look over the records of the different cows in this association, you will find that there are cows standing right in the same stable costing just as much practically to feed them, costing as much for care, and while one cow is returning to its owner \$3.00 worth of milk for a dollar's worth of feed, another cow as good looking, standing right beside her, is returning to her owner fifty cents worth of milk for a dollar's worth of feed.

That shows you briefly the object of a cow testing association. We got this same Mr. Rozema to come down to Coopersville one time to a dairy meeting to talk of cow testing associations. Among other things he said he had two cows in his herd he did not like the looks of, they were sort of rawboned, ordinary looking cows, and he was going to sell them but they just organized this association and he thought he would leave them in one year and see what they would amount to, and they proved to be two of the most economical producers he had in his herd, and they were not for sale after that, but some of the nice looking cows he would have sold for anything, they went for bologna sausage. That is all you can tell about this.

Now then, what can cow testing associations do for a community or for this state? That is a practical question. I will tell you what they are doing at the present time for this state. They are proving to the farmers of this state that it is more profitable for them to feed the feed they grow on their farms to the dairy cow than it is to sell it off their farms in the open market. Do you know there are lots of farmers in this state, some that keep a pretty good bunch of cows, that will tell you they keep cows because it brings in a cash income regularly and systematically, brings it every week or every two weeks? It is a nice thing to have a business bringing you a cash income at stated intervals. It makes a man thrifty; he knows what he can do, he can figure his expenses accordingly. That is one reason. Another reason is that farmers who keep up the fertility of their soil believe in live stock husbandry and so they keep cows for that reason. Another reason is that a farmer can distribute his work better throughout the year, if he can employ men by the year instead of the portion of the year, if he has a good herd of winter dairy cows he will have practically as much work on his farm in the winter as in the summer and he can get better men. He can make more of a business out of farming with a good commercial herd of cows on the farm than he can without it; but those same men will say, nevertheless, "We believe with the present price of feed if we sell the feed off the farm we would have more cash than we would from the dairy products that we can get from the cow." Now, my friends it was a hard matter for Mr. Hull and myself to make the average farmer audience believe that was not so. I could tell them that I kept track of what my cows produced and what it cost to feed them and it paid better to sell the clover hay or corn or oats I raised, but they would say "Lillie and Hull are paid for talking that way. They would not have any argument at all if they did not have

ingenuity enough to have that appear as a fact." Then I could tell you, as Mr. Raven started to tell you yesterday, that the experiment station at the college authorized Professor Smith to go out and buy a herd of thrifty common cows, put them into a good barn having comfortable quarters, charge the cows with everything they consumed and the labor in caring for them, giving them credit for what they produced at market prices, to see whether it paid or not. The result was published in a bulletin. I figured it from a business proposition and found the state of Michigan made 29 per cent interest on the investment. A farmer will say "We cannot do as the experiment station does." Any argument you could bring up would glance, it would not sink in at all, but now here is something. There are 239 cows that were handled down around Fremont, under ordinary farm conditions down there, and those cows, good and poor, gave the farmers \$1.73 for every dollar's worth of feed which they consumed. If they had sold the feed off the farm at market prices the value would have been represented by the dollar. If they had sold the clover hay, the corn stalks, etc., at what they had figured here their value would have been represented by a dollar. Instead of that they sold the crops to their cows and sold the butterfat at the creamery, and received \$1.73 for it.

Member: How much ensilage did they feed? How many were feeding ensilage?

Mr. Lillie: They fed 30 to 40 pounds. Probably four-fifths of them were feeding ensilage.

Here we have a record of four cooperative cow testing associations in the state of Michigan, and the second report of the Fremont association. There is another year completed now but it has not yet gone to press. It takes about a year to get these reports through the public printing office, but this will be the next year's record and we have three more cow testing associations in Michigan, one at Coopersville, another at Bay City and another at Lapeer. There were approximately in those four associations 1,200 cows, and those 1,200 cows on the average returned to their owners for every dollar's worth of feed \$1.85. That is better than to sell the feed from the farm. Of course that is simply taking into consideration the feed, it is not taking into consideration the labor. In this cow testing work we get the skim milk, the manure and the calf for the labor in caring for the animal. We simply take into consideration the feed at the market price, what we could get for it if we sold it off the farm, and the market price of milk or butterfat which is received.

The Dairy and Food Department has taken it upon itself to foster and encourage these associations. If any community thinks they can organize a cow testing association we will be very glad to send an inspector there to investigate it, to drive around among the farmers and assist in every way possible to form an organization. It is advisable to incorporate under the laws of the state but it is unnecessary unless you so desire. The Dairy and Food Department agrees to furnish you blanks gratis for recording this work, to furnish a book that will be permanently preserved, and it will, so long as it can, publish the records of the associations in bulletin form. I do not know how long that will last; it may get to be so it would be burdensome to do it, then some other provision can be made. We lend the cow testing asso-

ciation a Babcock tester for one year; we do everything in our power to get a man to do this work and we assist you all we can. We give the work supervision. We agree to investigate it once in a while if you desire, to see that it is running along in a practical way, because we realize that we cannot do a thing that is of more practical value in building up the dairy interests of this state than lending our influence to the organization of those cooperative cow testing associations.

Another idea that has recently come up in connection with this, I am only going to present to you briefly and you can use your own judgment, but the idea is we are finding out a good many common grade cows in these cow testing associations that are profitable producers. Some of them are producing three hundred and four hundred pounds of butterfat in a year, they are splendid cows. We did not know we had so many good native cows, and the idea has been suggested, that it would be a good thing to in some way to register grade cows on performance. Can we not, and would it not be profitable to have some sort of organization or association so that we could register those cows and mark them permanently so we would know and then we would have a better foundation for the upbuilding or upgrading, and would make more rapid advancement in the development of profitable dairy cows? You people who attended the state association meeting at Grand Rapids noticed we had this topic on the program there. It seemed to be the opinion of the dairy farmers there that this idea was practical and ought to be put in practice, a resolution was passed recommending that and the standard was adopted for grade cows. Personally, I believe it would be an excellent thing. I believe the pure bred animals would gradually come over into this organization because no animal there could be registered except on performance; because the sire or the dam was a registered animal would not allow the progeny to be registered unless they performed profitably. Put them in on their merit and if they have no merit then their breeding amounts to very little. That is the way we classify men in this world and I do not know why we should not classify animals in that way. In America we do not care what a man is, whether he is a rich man's son or where he comes from, if he does not amount to anything we do not give him our confidence. On the other hand, if he comes from the county house if he makes good he has our confidence and respect, and I believe the same is true here. I believe this would finally bring about the best, most productive and economical producers of dairy cows we could find in existence anywhere.

#### DISCUSSION.

Member: Do you mean to have those pure bred animals registered on performance afterwards?

Mr. Lillie: Yes Sir. They have an advanced register of merit. They are working into that idea but just the same they can be registered without that. They register certain animals on performance. That is giving them a better record but there is nothing for the common man to start from to build up so he can be recognized. He can buy registered sires and use them indefinitely and he can never get their progeny to be anything but grades. If we start to register grade cows on

performance we would have something as valuable as a pure bred association in a few generations.

Mr. Miller: What did that poor cow, that ate a dollar's worth of feed and returned fifty cents worth of milk, do with the rest of her feed?

Mr. Lillie: God only knows. The majority of them take on flesh, some of them we do not know what they do with it. Mr. Hull says there are three kinds of cows; one consumes the feed we grow on our farms and makes it into meat on her back, another consumes the feed that we grow on our farms and puts it into milk in the milk pail, and the other consumes the feed on our farms and God knows what she does with it.

Member: I fail to understand the necessity of testing so often. As I understand it, a test of a cow's milk at any given time determines the quality of that milk. I am trying to learn something of the dairy business. I have been handling cows all my life and my experience began away back when we had about as definite an opinion of quality of our cows as Bill Nye did when he said he had a cow that gave milk occasionally, but I understand the butterfat is practically the same. That is, you cannot increase it or decrease it no matter what you feed the cow, her milk will test just the same. That being true, why the necessity of such repeated tests? Let an expert come and test your herd and let the per cent of butterfat present be determined, and that on a determination as to the profitableness of each one and from that on a farmer can keep his own records. He can weigh his milk and his feed, he can weigh it daily or strike an average as has been suggested, and I do not understand the necessity of having an expert come so often as such great expense.

Mr. Lillie: The majority of people think that once a month is not often enough. While a great many things you say about the per cent of butterfat varying is so, yet you know that each cow does vary in the per cent of butterfat they put in the milk. A cow tonight might give five per cent and tomorrow morning give three and one-half per cent milk. We know a cow never gives as rich milk when she is fresh, during the first of the period of lactation, as she does later on nearer the close of the period of lactation, when she gives the richest milk, and if we could once in a while determine this and leave the records to the farmers, it comes back to the proposition that the records will not be kept and people will not believe them if they are kept. They will say "He wants his cows to make good records and he will favor the cows," whether he does or not. We want those records and want them authentic and want them so people will have confidence in them, and once a month, it seems to me, is certainly none too often to test the cows.

I do not consider a dollar a cow every year very expensive. A man who has ten cows pays the tester \$10 for coming to his farm every month in the year and doing this work. Ten dollars is nothing compared to putting the business on a business basis. You can afford to pay double that and more, to do this work, if you could not get it done cheaper.

Member: Do we understand the feed being the same the cost of butterfat with each individual will vary?

Mr. Lillie: The cost of butterfat will vary with the price of butterfat and the cost of feed.

Member: I had the idea that after having determined the cost of production of butterfat and feed being the same, you had it right down.

Mr. Lillie: No, it is rare we get a cow that for two years in succession will produce butterfat on the average for the same price and a cow does not always do her best. Your way might enable you to pick out the best cows from the very poorest but it would not be approximately correct.

The Chairman: We have another subject here and we must give Mr. Hull a little time on it. Mr. Hull will speak to us on Silos and Silage.

## SILOS AND SILAGE.

MR. N. P. HULL, DIMONDALE.

Mr. President, Ladies and Gentlemen:

I rather think I told all I know about silos here two or three times but perhaps it will be all right for me to say it over.

We all know what silos are. There is no use of my stopping to talk about silos up in this county. You all know that silos are a building for preserving the green feed in the succulent state. You are most all concerned to know which is the best form of a silo and if I knew I would be glad to tell you, but really I do not know. Going over the state, as I have, I have seen most all forms, I think, and if you get a good silo built correctly of any of those different materials you will have a good silo that will keep silage practically perfect.

There are two or three things that you want to be sure and keep in mind in erecting a silo. First, have it air tight, no matter what material it is made of. You may take a stave silo, it may not be air tight when you fill it but, if properly constructed, it will be air tight shortly so you can preserve the material. The walls should be perpendicular all the way round and then they want to be smooth, they must not go in and out. The greatest difficulty with the cement silos that I have found, so far as that one principle is concerned, is the forms will not be exactly true and you will find the silos in and then out somewhere, and of course where you find them in and out there is an air space and you will find spoiled silage. The first principle then about the cement silo, and it rather seems to me the cement silo is going to be the silo of the future as they are getting now in some of lower tiers of counties where they are building them almost as cheaply as they are the stave silo, the first principle about a cement silo is to see that you have a solid foundation. Understand, you are going to have an enormous weight in the superstructure and in order that it will not settle and cause a crack you want to have a good strong foundation.

The next proposition, after seeing the walls are perpendicular and



smooth, is to see that they are properly plastered on the inside so as to prevent the air getting through them. You know if you take a cement block wall and throw a dipper of water on there you will hardly notice it go to the ground, it will be absorbed by the cement block. It will also absorb air but by plastering on the inside with strained mortar, no poorer than two parts of good sharp sand to one of mortar, and troweling with a steel trowel, a silo can be made that will preserve ensilage almost if not permanently. The cement block silo is a nice looking silo and it looks as though it might stand as long as any of us would want a silo. Either you must have hoops on the outside or else you must have rods around it. If the blocks are built with a groove so you can put a round around inside of a groove it will do as well as to have a hoop. I see no reason why it cannot be reinforced so as to make it perfectly firm and that is, of course, all we want. I need not spend any further time on that discussion.

## DISCUSSION.

Mr. Leshner: A man was building a cement silo last summer. He got it up some fifteen feet and I asked him if he should not reinforce it, and he said it did not need it. He had a little lug in the depressions in the block that set in there. If he goes the full height of that silo I claim it would not stand. He said he would not hoop or have any reinforcement there. Do you think that is practical?

Mr. Hull: That is something I have not seen much of, and I would prefer not to express an opinion.

Mr. Lillie: He will know more about it after he fills that silo.

Mr. Hull: You do not want to go eight or ten feet down below where you are going to take the silage up. It is no cheaper to go down there than to go up, and the idea of hoisting all that heavy silage eight or ten feet seems too much like work; but you can go below the level of your barn and cement that up, then put on staves or any other sort of structure.

Member: I have a stave silo and my ensilage freezes. I thought building down ten feet so in the early part of the winter it will not freeze, and when it comes to freezing weather again have it protected from the frost below the surface.

Mr. Hull: We have been told ordinarily to use an inch off the surface of the silo each day and then the silage will not deteriorate. That is all right in warm weather, when your silage is going to freeze, do not be afraid of deterioration. The first year we used ensilage out of a stave silo we found a line of frost around so we left that. The next morning it was frozen a little farther and when it began to loosen up and came down there it deteriorated before it was all fed. Now when we start in the top we take out eighteen inches. We may in the intensely cold weather find a little line of frozen silage down three inches perhaps four inches. We leave that little line around there but three inches below that we can take that silage out clear to the staves. As far as you go down take two feet, the next morning take another two feet, and you will not be troubled with frozen silage.

Member: I will never build another stave silo. I believe a cement silo or block silo is the proper thing.

Mr. Hull: You would have as much silage with a cement silo, unless you have hollow blocks, as you would with a stave silo.

Mr. Harris: Would not the size make a difference?

Mr. Hull: Yes, the bigger body you have the longer it will hold the heat.

Member: A man with a herd of six or seven cows cannot have a big silo.

Mr. Hull: How about it, Mr. Grant, does your block silo freeze the silage?

Mr. Grant: I have had no trouble this winter but I think the hollow blocks help us.

Mr. Hull: Of course you have tile in that will conduct the frost.

Member: Why could we not introduce artificial heat?

Mr. Hull: I suppose you could.

Mr. Lillie: The gentleman means to set an oil stove in the silo over night. That would not be too expensive.

Mr. Hull: What would be the objection to setting an oil stove in the hollow space?

Mr. Lillie: This oil stove would work in any silo.

Mr. Hull: I never have been troubled in Eaton county since that first winter. We have had some cold winters, but as far as the silo is concerned it has not made any difference since the first winter. Of course the silo we feed from mostly in cold weather is 16 feet in diameter.

Now I must go on with this because we have not very much time. Just a few words about whether we ought to have a silo or not, that is the main proposition. If a man has six cows and a little other stock he can have a silo profitably; if he has ten or more cows, there is no man with his buildings permanently located that is going to stay in the dairy business, that can afford to be without a silo. I am sure that is so. We can say that over and over again and still a good many men do not build silos. I am going to give my reasons briefly and if you think the reasons are not true tell me, why they are not true, and if true ask yourselves why you should not have a silo.

The silo is the cheapest form of storage than any other form of building that a man can build for the same money that will as successfully store as much feed as will a silo, so it is the cheapest form of storage to begin with. Many men have thought that a silo was a rich man's luxury; if a man had lots of money he could afford to have a silo but if he did not have the money he would have to get along without it until he got better off. Now I am going to say to you in all honesty and frankness (it means nothing to me personally, I am not interested in the construction of silos or selling silos) that instead of being a rich man's luxury it is a poor man's necessity because the rich man can get along whether he makes money or not but the poor man wants to make money as fast as he can and get better equipment rapidly as he can, and the silo in dairying will certainly do that, will enable a man to make more profit out of his dairy and he must have some sort of storage for his forage, and the cheapest sort of building he can construct to successfully store a large amount is the silo.

The next proposition, a man can harvest his corn crop more cheaply by putting it into a silo than he can harvest and get it ready to feed

in any other way, unless he feeds from the bundle and shock. If a man wants to feed from the bundle I have no fault to find, but it is not the best thing for the dairyman. I think any man who has practiced dairying for any length of time will not question that. Some may question about its being cheaper. Of course when you first build a silo in the neighborhood and you have to get all the machinery yourself it is considerable initial cost before you start to build the silo, but if several get the machinery, and you have silos enough around Traverse City so you could all get the machinery, and with that machinery keep track of all it cost to put your crop into the silo, and then the cost of putting it into the crib and storing the fodder, in my experience it costs 15 per cent less to put it into the silo than to crib the corn. Had I time to dwell upon this I could show you where that difference comes in.

The next proposition, we preserve a larger per cent of the actual feeding value of the corn crop. What we lose by field curing the corn is an uncertain proposition. Talking with Dr. Beale, he told me he thought it ran from 35 per cent to 60 per cent of the value of the fodder, and we count the value of the fodder about 40 per cent of the value of the product, so in field curing we lose 35 per cent or 60 per cent of 40 per cent of the value of our crop. Of course the amount we lose depends on the time it is cut, the size of the shocks in which it is cured, the length of time it has to stand in the weather and the length of time it is put in after being cured, but you lose somewhere between 35 per cent and 60 per cent, with a probable average of about 45 per cent. It is difficult for an ordinary farmer to come to very close figures on the waste. With a good silo one ought not to lose over five per cent of the feeding value of the corn, so in actual food value we save by putting that corn into the silo the difference between five per cent and 45 per cent, or we save 40 per cent of the crop. After a man has grown his crops, with the high price of feed in this part of the country, he cannot afford to lose as large a per cent as the difference that is lost between field curing and putting it in the silo.

The next great proposition is the succulence of the stuff. No man questions the healthfulness of growing June grass green pasture. There is something about the natural plant juice that stimulates the digestion and assimilation. We have all seen it enough to know it is true. We may have a calf that gets out of condition, it has indigestion, I suppose from the effect of too long a period of dry feed. You turn that calf out, or that colt or steer, on succulent pasture and this difficulty will be corrected because of the stimulating or corrective influence of that natural plant juice. You cannot have that in January. The nearest you can come to it is to build a silo, cut that corn when it is in the proper condition and put it into the silo and conserve that natural plant juice which helps digestion and assimilation.

The next general proposition is that it is more palatable. The longer I have been dairying the more I am satisfied there is no one attribute of the ration that is so valuable to the feeder as that particular question of palatability, that the stuff shall taste good to the cows. If any man has seen cows eating good silage, that is being fed sweet silage in connection with other good feeds, he will admit the cows like ensilage. There is no question about it and there is no other form of

roughage that I have ever fed that the cows like as well as ensilage, so I argue that it is especially profitable from that standpoint.

Now if it is true that the silo is the cheapest form of successful storage, if it is true that you can harvest a corn crop more cheaply, if it is true that we conserve a larger per cent of the actual feeding value of the crop than before, if it is true that we have a succulency that aids digestion and assimilation, aids in the working of the machine we are handling, and tastes better to the cow, can one who has the proper amount of stock afford to be without a silo?

I have given you my reasons. If any man has any questions to ask I shall be glad to answer them.

The Chairman: Would you mind telling us the quality of corn you have for silage, time for cutting it, etc.?

Mr. Hull: There have been men who have owned silos and condemned them, you all know that. That is nothing against the silo really, because there never was anything so good in the world yet but some man condemned it, but there has been some reason for some men condemning silos. One is that the silo was not properly constructed in the first place and the next reason, and perhaps the greatest reason that people condemned silos and silage, is the fact that the silage was not put up right, that the corn was cut at the wrong season and not put in there in the right shape. When shall we cut this corn and put it into the silo so it will do us the most good, that the silo and silage shall be most successful? We are cutting it for food and want to get the profit out of it. When is the largest amount of food in the corn crop? Just when it comes to maturity, the chemists tell us, and they have analyzed it times enough so they know, and our practical experience bears that out. It is just the minute you can cut that corn plant off and set it up there to field cure when the kernels will be mature. With every corn plant that is just the time that every individual plant has the largest amount of digestible nutrients. Inasmuch as we are cutting it for food, why not cut it when it is worth the most and put it in the silo. Certainly we will get more food now because a silo will not put anything into the plant that is not there when it goes into the silo and it may take something out of its actual value, but we certainly get more food value to cut that plant when there is the largest amount of food value in it.

Then the next proposition is, if we cut it much before that time there is too large a percent of succulence in there, too much juice, and the effect of too much juice in the silo is to develop too great an amount of acid, and when you get that sour musty silage, you get a food that is unwholesome, and if you feed very much of it it will throw your cows out of their normal condition and they will not look as well and their milk will not be as good. There is no question about that. If you wait very much after that period you are losing in food value because a part of what was digestible at that time becomes woody fiber and becomes indigestible, and you have not as large an amount of food value. Your silage will not have enough juice and you will get musty, mouldy spots, and that sort of food is unwholesome to a cow. It is true that it is better to cut after the time than before the time because you can add water when you are putting the corn in the silo, and preserve the

silage in good shape and have good sweet silage. You will not have as much food value as you would have had to cut that corn when it is just mature.

I believe the earliest variety of corn that will ripen in your climate is the right variety of corn to put in your silo. You are better able to judge what kind of corn that is than I am, but that is what you will find, and I believe that is the practice of the men who have been most successful along dairy lines and silo lines in Michigan and adjoining states.

Member: Does it make the most silage or is it more palatable?

Mr. Hull: You will get the most digestible nutrients to the acre.

Mr. Harris: How about other crops; clover?

Mr. Hull: I never put them in my own silo. I presume there are instances when it is wise to do this thing but you take the hay plant and it will cure without any great amount of loss, that is if we have curing weather.

Mr. Harris: We always have a dry spell in the summer. If you have only one silo it would be convenient to put up clover to carry us over the dry spell.

Mr. Hull: From the fact of the open stalk with the peas and oats and clover you do not get as large an amount of the air excluded and you lose a larger percent of the feeding values of the crop of the hay, grass or peas and oats that you put in the silo. You do not exclude the air so well and it loses a larger percent of the digestible nutrients of the peas, oats or clover, but still it is practical under some circumstances.

Member: What is your manner of planting?

Mr. Hull: We plant in drills three feet apart. We set them to drop from eight to ten inches apart. It may go up to 12 inches apart too where I have the large varieties of corn, but we put in about one-half more seed when we plant a field to put in the silo than when we plant a field to harvest as a crop of corn.

Member: How many tons to the acre do you get?

Mr. Hull: It depends a good deal on the season but it will ordinarily run 12 tons. I have grown 15 tons to the acre but that is an exceptional crop.

Member: I have grown eight tons to the acre.

Mr. Grant: Would you use the Cuban Giant corn that does not ripen with us?

Mr. Hull: No you do not want to, it would not give the food value and you are bound to get that sour ensilage, and you may get some objections from the people who are using your milk. Even with the Holstein cows, as good as they are I would not want my milk from a Holstein cow if she was fed with Cuban Giant corn up in this county.

The Chairman: I believe this question of silos and silage is one of the most vital questions in this part of our state. I know that most of us know we can scarcely afford to pasture our cows at all, in other words we scarcely have any pasture at all. We may have a few weeks of good pasture in May and June but the balance of the year the cows simply ruin the fields tramping out more than they get from it, so that it is the silo that helps us out, and anything that Mr. Hull can bring

us I believe he is willing to do or anything you wish to know in regard to this I believe he will tell us.

I put up a cement silo last year. I saw one before but I never saw one constructed and several have been to my place since to see my silo. A gentleman here showed me a picture of a cement silo that had a crack in it, into which you could put your hand. In the first place your foundation is the main thing in the silo of any kind but especially with a cement silo. There is an immense weight there, not only of silage but of cement blocks. My silo is only a small one, I keep only 12 dairy cows and our silo is 10 feet across the inside and 30 feet high. It is perfectly smooth, just as straight inside as a dye.

Member: It seems to me the most important feature of the whole silo question is the kind of silo to build. There are so many claims put before us that it is quite confusing to us farmers who do not know how much about them. As a matter of fact, it seems to me they are in the experimental stage. Here today I have been solicited by a half dozen agents for silos, each setting forth the value of his own over the others. Since you have come here we have had the advantages of the cement silo set forth. If we can hit on something that will stand all manner of tests that is what we want. It seems to me that the cement silo, all things considered, reliability especially, would be the silo to build unless the action of the acid caused by the silage would operate on the cement so as to weaken it and shorten the life of the silo. I wonder if there could not be something found that would stand this action of the acid and make it impervious to air. If there can be constructed a silo out of cement that will last and if it can be made frost proof and acid proof then we would have the ideal silo.

Mr. Grant: We simply plastered the inside with cement, one to two, and it makes a perfectly smooth and air-tight silo.

Mr. Hull: I think the least important proposition is what sort of a silo we have. We are not in the experimental stage any more. We know the cement silo is all right. I am not too sure that the acid will not affect that cement in a few generations, but if it does plaster it over again. There is no difficulty about that. We have had those silos until we have proven conclusively that they keep silage perfectly.

As to the question of expense, I think here close to Traverse City there might be good gravel ground close to your farms. I have seen holes that looked to me as though there might be gravel in them. With gravel you can get your cement reasonable and if you can get hold of forms you can build that silo somewhere near the cost of a stave silo or close to it. In another place where you have to go a long ways for the gravel, a man might get a stave silo and we know a stave silo is all right. When I built my silo I was advised to build something permanent. He told me the probable cost and I said "I can take the difference between the cost of my silo and that permanent silo and put it at interest, and the interest on that money will keep me in stave silos. There may be some difference in the original cost of the silo but you make more in the feeding value of that silage in a year. The first importance is to get a silo.

Member: In regard to a stave silo and a cement silo, I have had some experience with the stave silo. I have used mine six years, it

was a fine silo and my basement was built of cement. That is all right today as good as it ever was, but the staves that set on the cement have decayed so that another year I will have to take it down because those staves will need to come off and be reset in order to use that silo. The silo is made of white pine.

Mr. Hull: I have had for ten years a common, ordinary white hemlock silo and it has not given out along the bottom.

Member: I believe the hemlock is better than the pine, I do not believe it absorbs the acid.

Mr. Hull: How about the wall it sets on, does it run the water away from it?

Member: Yes the wall is plastered over that way, but it may be where the rains beat in in the winter time on the wall and the ice rots it.

Member: I have a cheap silo of white pine that I put up about the time this gentlemen did his. Mine stood on the foundation but I tarred mine with a good coat of tar on the outside and I cannot see but the foundation is as good as it was at the beginning.

Mr. Gray: I put one up the same year and mine is in perfect condition, but I tarred and painted it both inside and out.

Mr. Whitney: I wish to say just a word in regard to this matter before you. Mr. Lillie and Mr. Hull this morning saw some teams, weighing five or six tons, drive to the asylum over cement reinforced, and yet we have no fear whatever of those teams going in. That is nothing but cement. In California some of you remember the havoc made by the earthquake at the University. It shook all the buildings but one and that was cement. At Sacramento they are building a \$300,000 hotel this summer entirely of cement. It is absolutely fireproof and the builders guarantee it against earthquake. Steel is running all through it. They are using a twisted steel. I do not know why it is better but it is twisted steel running through all the walls. They claim it is better than the ordinary square steel. If California, with its earthquakes, can make cement stand I think Traverse City, even with our whirlpool here, can make cement silos.

What I want to speak about was that twenty years ago I traveled one whole winter with Governor Hoard in Wisconsin, an institute lecturer. I learned to know the value of the man and our friendship has been lasting ever since, and the other day he found we were to have a meeting here and he sent me some of his papers. I looked at one and found in it something particularly valuable, that is a description of the King system of ventilation, taken from King's new book. I shall be glad to give as many of you as desire a copy of the paper.

The Chairman: Is the committee on nominations ready to report? We will have a full report the first thing after dinner. Try and gather promptly at one o'clock as we have a full program for this afternoon. The first business after dinner will be the election of officers.

We will now stand adjourned until 1 o'clock this afternoon.

## FRIDAY AFTERNOON SESSION.

Meeting called to order at 1:30 P. M. by Mr. Grant.

The Chairman: We will first listen to the report of the nominating committee.

## REPORT OF NOMINATING COMMITTEE.

The report of your committee on nominations is as follows: We recommend that the present incumbents succeed in office for another year, Wm. Grant, President, Mr. Harris, secretary.

Report of committee accepted and adopted as read.

The Chairman: We will hear from the committee on resolutions.

## REPORT OF COMMITTEE ON RESOLUTIONS.—MR. LADD, CHAIRMAN.

Resolved, That the thanks of this Association are due to the State Dairymen's Association and officers, and the visitors that have come to us from that Association. We appreciate their presence.

Resolved, further, That we also thank the business man and citizens of Traverse City for special privileges conferred and the encouragement they have given us, and their mayor for his welcome to the city.

Resolved, That we thank the members of the high school for arranging to have the views shown last evening; also the newspapers for the able reports given to our meetings. We appreciate that the newspapers of Traverse City have always reported our meetings in a very full manner and we believe they are a help to the farmers in giving them higher ideals for conducting their business, with the result of a better product to the mutual advantage of the people in the city and in the country alike.

On motion, duly seconded, the report of the resolution committee was adopted as read.

The Chairman: The next on our program will be Balanced Rations by Mr. Colon C. Lillie.

## BALANCED RATIONS.

MR. COLON C. LILLIE, COOPERSVILLE.

Mr. Chairman, Members of the Association and Ladies:

I approach this subject of a balanced ration with some misgiving because I do not know how to treat it and have it amount to very much unless it is treated in a somewhat scientific manner.

A balanced ration is a scientific ration. I know that heretofore that



farmers have found some fault with the idea of the agricultural chemists figuring too much on agricultural questions and yet, I am aware that there is a great change taking place in the sentiment of the average farmer towards the agricultural chemist and the agricultural scientist than there was a few years ago. It is more than a half century ago that those great agricultural chemists laid the foundation for modern agricultural chemistry, agricultural science, and the awakening which those men created at that time also created an awakening for a better understanding of the laws of growth and nutrition of plants and annuals, and that was the starting of the idea of a balanced ration for animals. Now we, as practical farmers owe a great debt to those men because they helped to figure these things out for us. In the first place, up to that time we did not know very much about the food constituents of given plants. Agricultural chemists have analyzed these plants and found out their composition, have found out the amount of protein that each different plant contains, have experimented to find out what function protein performs in the animal economy and has found beyond the question of doubt that the protein in the food goes to build up the muscular tissues and vital organs of the body. The other class of food substances in food are the carbohydrates, and Dr. Robinson told you last evening that they go to produce the animal heat and energy of animal life.

Now there is another thing to take into consideration besides the analysis of the plant and find it contains a certain per cent of protein and a certain per cent of carbohydrates, then another question arises, how much of those food nutrients are digestible and how much indigestible? The only way the scientist can determine the digestibility of the food is by an actual feeding experiment. We must take the actual animal and feed the feed to him, know just how much of each food constituent is fed to him, we must analyze it to find just what part has been digested. You can readily see the amount of labor necessary by the agricultural scientist in order to find the digestibility of the different feeds we feed animals. That is simply laying the foundation for a balanced ration.

Then we have to learn something else. We have to know how much of those different food constituents an animal needs for different purposes. You see when you consider this question carefully you find out that science is not guessing at things. Science has to, by careful experiments determine the real facts. Dr. Kedzie used to tell us that science is the practice of any subject whatever. What it is after is actual facts, and so it is in determining a balanced or scientific ration, we first have to get the facts, then we deduce our ration, our principle or our rule from these facts. Careful experiments were made to find out how much of these foods the animals need under different conditions. In the first place they had to get what you might call a standard and they took an ox, to find out how much food in protein and carbohydrates of this food that an ox at rest actually needed as a maintenance ration; they had to assume a certain weight because the larger the animal the more feed it takes for a maintenance ration, so they fixed upon a thousand pounds as a standard. The idea was to feed this ox with the feed he needed to keep him just in the condition he was, neither gaining or losing, that would be maintaining life. It was found in this

careful experiment that an ox under those conditions needed 17 pounds of organic matter a day to maintain life; that so far as the food nutrients were concerned, he needed seven-tenths of a pound of protein, eight pounds of carbohydrates and fifteen one-hundredths of a pound of fat.

Some people get confused when we begin to talk about scientific feeding and balancing a ration. Fat and carbohydrates form the same logical function in the animal body, for both produce heat and energy, but fat is more valuable than starch or sugar. So when you figure a ration, to get your nutritive ration you multiply the amount of fat by two and add it to the carbohydrates, because it will do twice the amount of good in the animal economy as the starch or sugar. Here was the basis for a maintenance ration of an animal. The animal is put to work and it is noted carefully how much more food it would consume and what would be the nature of that. You can readily understand that when the ox goes to work that there is exercise of the muscles, that the muscular tissues are torn down, worn out, that they must be replaced, and we would expect that since protein is that part of the food which goes to build up the muscular parts of the body and vital tissues, that there be a larger consumption necessary of protein, and that was the case. The increase of protein was in excess of the other foods just as soon as the ox was put at work because there was exercise of the muscles which must be built up.

Let me say right here regarding these two foods, and Dr. Robinson also brought that out last night in his talk here, the animal economy can take protein and if it has a sufficiently liberal ration of protein, it uses what protein is necessary to build up the muscular tissues or to produce the actual product, then it can convert protein into heat and energy producing sources. In other words, protein can be used in the place of carbohydrates, but, on the other hand, the animal cannot take carbohydrates and use them to build up muscular tissues, and part of the body that contains nitrogen. You cannot take starch and sugar and fat and feed an animal and have that animal live and build up its muscular tissues or produce an animal product like milk, which contains casein, which is a nitrogenous product. On the other hand, you can feed the animal solely on a protein concentrate and have a healthy animal to perform all the functions of life. That ought to be taken into consideration.

It is not surprising when the animal is put to work that he therefore needs more protein in the ration than he would at rest, because you can see the muscles must be exercised; but when it comes to the question of a dairy cow, the cow does not need very much exercise and if she is left to follow her own inclinations she will not take much exercise. A good sensible dairy cow turned out into a good luxuriant pasture will not use very much of her strength, time and energy in gamboling around that pasture. She simply makes it her business to consume a large amount of the good succulent grass and then she lies down in a comfortable place and chews her cud, and when she gets hungry again she gets up and goes to eating. We have learned that the dairy cow giving milk requires little or no exercise, and the modern dairy cow is not allowed to take very much exercise because the dairymen cannot afford it and the cow does not require it. But they found, when

they began to feed the dairy cow giving milk, that that cow required an increase of protein in excess to the ox performing physical labor, and yet she did not take any exercise. They brought out the idea that to manufacture the casein in milk, which is a nitrogenous product, the cow should have protein in her ration; she cannot manufacture milk on a carbonaceous diet, she must get protein in that diet in order to get the production of milk.

Now, my friends, that is the basis of a balanced ration. The question is what proportion should there be of protein and carbohydrate in a ration. From what I have told you, you can readily understand that the farmer may feed a very extravagant ration by feeding an excess of protein. He would get a good yield of milk and would have a thrifty animal but it would cost too much because protein is the highest priced element in the food. Protein is the lean part of the meat, the white of the egg. It is the most expensive part and so you see if a man did not understand this in feeding the cow, if he did not understand how to balance the ration for a cow, he might feed an expensive ration and get no better results than he would with one less expensive.

Now these were the experiments of Keene & Wolf in Germany, it is to the German scientists that we owe the facts which are the foundation of this idea of the balanced ration; Germany was the first country to found experiment stations, Germany is considered in the lead in agricultural science today, she has a good lead and no country yet has caught up with Germany in scientific investigation along agricultural lines. The Germans are noted for this in every country in the land.

There is another thing to be taken into consideration in balancing a ration. A young growing animal requires a larger proportion of protein in the ration than a mature animal, because in growing there is a development of the muscular system which must have protein, while in the mature animal, where growth is completed, there is no development, simply enough to supply the waste. That ought to be taken into consideration. Of course we cannot go into this too much in detail, just simply to give a general view of the subject.

Then again, cows should be fed rations in proportion to the amount of milk which they produce. To get this down to particulars.—A cow that is producing a flow of 40 pounds of milk today should have a more liberal ration, it should contain more protein than the cow only producing 15 or 20 pounds of milk. That is evident, because she has to have protein enough to make the casein in the milk, which is a constant quantity in that ration.

Now what good does the farmer get out of this? We advise the farmer to make as a basis ration for a dairy cow in the state of Michigan, clover hay and corn silage. These are the two foods a farmer ought to pin his faith to as a basis ration. Clover hay contains one pound of protein to six pounds of carbohydrates, which is about a balanced ration for a cow giving an ordinary flow of milk. Corn silage is an unbalanced food. Mr. Hull this morning gave you the reasons why you should feed corn silage. It contains one pound of protein to 12 pounds of carbohydrates. Now, don't you see, if you caught the idea that I have been trying to give you in these few remarks, if we

try to make a cow live on corn silage alone that she would have to eat twice as much carbohydrates as she ought to get sufficient protein, consequently there would be a waste of carbohydrates, and you might as well throw that away. Clover hay is about a balanced ration. When we mix the two together we have a ration that is yet too wide. It does not contain enough protein in proportion, and it is evident to complete the ration that we want to put in a food, in connection with corn silage and clover hay, that is richer in protein than clover hay because clover hay is a balanced ration of itself and we put in an unbalanced food there, corn silage, so to balance up that corn silage, which is a carbonaceous food, we put in some food that is richer in protein than clover hay. Let me say right here that a ration should be balanced in another way than in its food constituents, it ought to be balanced so far as the bulk and the concentrated portion of the ration is concerned. It does not do to feed cows entirely on concentrates; we cannot get the best results to attempt to feed the cows entirely on bulky feed. One man says "If clover hay is such a good food and we have to produce it on our farms in order to have successful farming in the state of Michigan, why not give the cow clover hay entirely?" The reason is because it is too bulky, the cow has not capacity enough, she cannot eat sufficient clover hay so she will get food nutrients enough to do her best. That is all the trouble, and that same argument will apply to corn silage.

Then it is very evident, in computing a ration, with corn silage and clover hay as the bulky part of the food, that the rest of the food should be a concentrated food, and that the concentrated food should be richer in protein than clover hay, because it has to balance up the excess of carbohydrates in the corn silage. Now what will it be? Here is where the philosophy comes in. My friends, we cannot afford to feed corn meal as a grain ration with corn silage and clover hay, because it does not balance the ration, it does not contain enough protein. You might as well carry coals to New Castle and they have all the coals in Newcastle they want, and you have all the carbohydrates you want in the ration of clover hay and corn silage. What you want is more protein in there, so it does not do any good to balance a ration of clover hay and corn silage with corn meal. You can balance it with ground oats, you can balance it with ground rye. Now then, you want to understand that you can feed corn meal with corn silage and clover hay and your cows will do pretty well, they will give a pretty good flow of milk. What I mean is that when we begin to feed a cow that kind of ration that cow has to eat an excess of carbohydrates to get what protein she needs, and consequently we have to feed an extravagant, wasteful ration, and we cannot afford to do it. That is all the philosophy that is in a balanced ration,—feed the cow what she needs in the proportion she needs it.

If you want to grow a ration on your own farm to balance up corn silage and clover hay then grow field peas, harvest them, thresh them, grind them in the mill and mix it as a grain ration with corn silage and clover hay. There is nothing better. Field peas contain over 20 per cent digestible protein, corn meal contains only 9 per cent. Cannot you see the different result you get, that it would not take as much

pea meal to balance up corn silage and clover hay as corn meal, while in fact corn meal would never balance it.

If you do not want to grow the peas on your own farm and you buy a ration outside of your own farm, then what you want to buy is protein, digestible protein, in your feed, and other things being equal you buy that feed in which you can buy a pound of digestible protein cheapest. You can buy cottonseed meal, you can buy oil meal, or gluten meal, you can buy dried brewers grain or malt sprouts, any of those, because when we manufacture out the grains in these various products what we want to get out of them is the sugar and starch, and the by-product is there, protein. When you grind wheat into flour and screenings, you separate the bran, which is rich in protein, from the flour, which is richer in carbohydrates. The bran, so far as human food is concerned, is a by-product and the miller sells it to the stock grower. The stock grower needs it because he wants to balance the home grown foods on his own farm; the same way we make starch out of corn or whiskey out of corn. To make whiskey it is necessary to get the starch out of corn, then convert the starch into sugar and the sugar into alcohol, and the by-product is that part of the grain which is rich in protein. We take the oil out of flaxseed and make linseed oil, which is used for commercial purposes, used largely for paints. That contains the carbohydrates, and we do not want carbohydrates, but the residue that is left, the oil cake and oil meal, is rich in protein and that the farmer wants to scientifically balance his ration that he is going to feed to farm animals. The same is true of many of the farm products. You see that nature figures that the animal will not always be able to get her ration containing the food constituents in the right proportion and so nature makes provision for this excess, or this unbalanced food. That is the reason why a cow can take an unbalanced food and make good milk out of it and keep healthy, because her economy is constructed in such a way that she can throw off the waste. What the farmer wants to do is to step in with his knowledge of this question of feeding and eliminate that waste, and consequently make more money.

Now how to figure out a balanced ration. You have a certain feed you want to feed your cows on the farm. You have corn silage and clover hay. Now as far as bulk is concerned, make up your mind about all the clover hay the cow will eat clean and all the corn silage the cow will eat clean, then weigh that and see how much you have. Then go to your table of feed analyses, which you can buy in various places, that are published by experiment stations giving the analyses of the different feeds. Find out how much protein and how much carbohydrates you have in those bulky feeds and add them up. Now a cow giving milk ought to have at least  $2\frac{1}{2}$  pounds of protein per day in her ration; she ought to have  $12\frac{1}{2}$  pounds of carbohydrates and 4-10ths of a pound of fat. That is what has been determined by different experiments. That would make her ration of 1 pound of protein to 5.4 pounds of carbohydrates. Nobody claims these tables are absolutely correct but you can readily see that it was an immense amount of labor to compile them and you can see that working with different animals might make a little change, but the principle is right. This whole theory and this whole system, which nobody claims is absolutely correct,

is a guide. It is like having blazed trees through the wilderness; if you follow those blazed trees you will come out the right place but if you go to the right or left where you cannot see them you are in the wilderness and are lost, and that is the case with feeding of animals. Nobody argues but you want to take into consideration, in feeding animals, their individuality and that one may require more feeding than another, that one will take care of a little more carbohydrates than the other, but that does not in any way interfere with the true theory of a balanced ration.

Suppose you find you have only  $1\frac{1}{2}$  pounds of protein in your roughage ration, that you lack carbohydrates in your ration. Put in enough pea meal so as to get your protein but do not put in an excess of it. If your carbohydrates do not come in just according to the standard, do not worry about it because if you do not figure on this thing at all ten to one you would be feeding a great deal too much carbohydrates, and every time you figure on this you get a little closer to the economical ration. Every time you change the feed figure out how much of that feed you ought to put into the ration in order to get a standard amount of protein. You can feed your animals all the time on the farm a great deal cheaper if you use this theory of the balanced ration as a guide. You will save money that you are now losing and it is worth saving. The practical farmer of today must be a business man, he must use his head and the lead pencil in figuring out the cost of everything that goes into his business of farming. He ought to begin on the ration for his farm animals. I have seen many times that the average farmer in the state of Michigan loses enough in feeding his farm animals to send the boys and girls to the agricultural college.

I have told people before now, when they told me the feeds they had in their ration, the bulky feeds, and asked me what grain to buy, whether to buy cottonseed meal or oil meal for concentrates, that they could afford to pay three times as much as they would have to pay for cottonseed meal in preference to using corn meal. You have this concentrate with corn silage and clover hay. Cottonseed meal contains about 37 per cent digestible protein and corn meal contains none. Now so far as balancing up the home grown ration is concerned, one ton of cottonseed meal will go as far as four tons of corn meal, so what is the use of putting corn meal in the ration? There is no sense in it, it is a waste of money. When wheat bran contains 15 per cent digestible protein and oil meal 30 per cent and a little over, what is the use of paying the same price for wheat bran you would have to pay for oil meal, when one ton of oil meal is worth as much as two tons of wheat bran to balance a ration? You get the same constituents, just what you need and you have just as good a ration. If you buy two tons of wheat bran and feed it to the cow you get more out of it than you would for the one ton of oil meal. You do get a little good because it is fertilizer but it is quite expensive fertilizer and you might better buy commercial fertilizer than to buy wheat bran as a fertilizer because its greatest value is for feed.

We could go on and illustrate this idea of a balanced ration in many different ways by taking concrete substances and illustrations. For instance, I have heard Mr. Hull illustrate this in a talk by say-

ing, "If you are going to build a house you know that house requires a certain amount of stones, bricks, cement and lumber, windows and doors and the various building materials that we have to have, nails, etc., and we have to have them in the right proportion in order to get a good structure. Now then, under the same principle, when you have a living animal that requires to have its tissues built up in the right way, and you demand that that living animal manufacture you a complex product like milk, that contains many elements which have to be put there, you have to feed that animal the same elements which you require her to produce. It can be illustrated in that way; but it strikes me that we will get the best idea of a balanced ration when we pin our faith to the analyses of the food by Keene & Wolf, of Germany, and by the experiments of Keene & Wolf in Germany in actually feeding the feeds to the animal and noting the results and the lessons that these things have. The other way it is simply a concrete illustration without getting down to the facts of the case.

I would be glad to answer any questions I can on the subject.

#### DISCUSSION.

Member: I would like to make a few remarks regarding my experience this winter. I have a son who took a short course in the college. We started in to feed our cows ensilage and oat straw for roughage and rye and oats for a grain ration. We did not have the clover for the grasshoppers took that. We did not think we were getting as much from the cows as we ought to and I told my son to study up a little on the ration. He went into a little library and got Professor Henry's "Feed and Feeding and studied it quite a while, and he found he did not have protein enough in the ration. We ordered two tons of cottonseed meal and I think he fed about two pounds of it twice a day, reducing the rye and oats about one-third. The result was, after keeping on that way for a week or ten days we got 40 pounds of milk more a day from the same number of cows, just 40 pounds of milk more from feeding cottonseed meal and reducing the rye and oats. We did not have any clover hay.

Mr. Harris: Did your ration cost you any more?

Member: It probably did a little, but we were more than repaid. We paid \$34 a ton for the cottonseed meal right at the station. Oats and rye are high so perhaps it did not cost any more.

Mr. Lillie: I doubt if it cost any more. Did you take the analysis of those feeds and figure out how much protein each cow was getting?

Member: My son figured it out according to Professor Henry.

Mr. Lillie: That is right, that is the intelligent way to get at it.

The Chairman: Our next topic is by Mr. E. L. Ransom, "Profits from Dairying."

## PROFITS FROM DAIRYING.

MR. E. L. RANSOM, TRAVERSE CITY.

Mr. President, Ladies and Gentlemen:

I have been asked to talk on profits from dairying. I am not quite so scientific as some are. I am willing to admit that. I have been afflicted all my life with a lack of knowledge. Of course it is embarrassing to say such things but a man better do that to lie, and that I would not do.

Profits from dairying. If you were to ask me how much money I made this winter out of my dairy cows I would tell you I did not know. Ever since last November I remember well I held down in my pocket a dollar all the time. We are creatures of circumstances and governed thereby—propelled, impelled and compelled. The other day my team ran away and now I have to take an old buggy to deliver my milk because the blacksmith is fixing my wagon.

On a piece of land, none too rich when I took it, none too rich today, I am willing to say that I firmly believe, with what little talent I have, that it is better than it was when I went on it. I had the first year a piece of ground in corn, it was planted when I got the farm. That corn grew perhaps four feet high, but since that I have had on that ground what I call good corn and considerably higher than it was then when I first went on the place. So the profits in dairying not only means the money we get in our pockets but something to keep up the fertility of the soil. If we do not do that we might as well move off the farm because it would be like putting a thousand dollars in the bank and drawing it out gradually; after a while it would be all gone. But as I said before, I have that dollar in my pocket and when I go out and live on my farm and see a considerable pile of manure spread out there, I realize that that is what makes profits in dairying.

As I said before, we are creatures of circumstances and must be governed thereby. Last year was a short year and, as I acknowledge to a lack of knowledge and good judgment, I did not cut my corn quick enough and my ensilage was not good. The corn grew all right but the dry weather came on and dried it right out after I commenced cutting it. I commenced putting it in when it was green but it burned all up at once, and as a consequence I lost by the elements and through a lack of knowledge.

There are some profits in dairying if we work the business right. I am satisfied of that from a little experience and what I saw when I was in the west. I have been trying to raise a little alfalfa and I keep going a little deeper and deeper into it, and as I got more encouragement this last year I had quite a lot of alfalfa hay. I made the remark here three or four years ago when the price of bran was so high, that when I paid \$10 a ton for good bran I thought I was giving a good price for it, but what is it today? It has gone out of my reach. For the last two years I have not fed any bran. I am not as scientific



a man as my friend Lillie in figuring out a balanced ration, but I told my neighbors right here in this room that when I could get good alfalfa to grow sufficiently to feed my cows I would not use any bran, and I have not used any for two years. Alfalfa is going to be, in my opinion with the knowledge I have, the coming grass in this county for hay. Scientists tell us that it requires a different bacteria to produce alfalfa than red clover. We had an awful storm the first year after I sowed my alfalfa. After that year it began to take on color, the bacteria began coming and ever since that time I have been having better success. I have been studying that considerably too and while I have not made a perfect success of it yet I expect to if I live long enough. By raising when we can that alfalfa hay on our farms and then having some good corn silage I do not think we will have to have any bran. I shall not at least because this winter the alfalfa, corn silage and red clover hay have made all the milk I wanted for my trade, and I had cream for sale, and we made our own butter, and that with an average of fifteen cows.

Now I will say, referring to some things that have been said about breeding dairy cows, that I received more this winter from fifteen cows than I formerly did from thirty-five such as I could buy through the country.

Mr. Lillie: As I understand, Mr. Ransom does not feed any grain at all, simply alfalfa hay and corn silage?

Mr. Ransom: That is all I fed this winter.

The Chairman: Mr. Robertson is to give us a talk on "The Pleasures of Dairying."

## PLEASURES OF DAIRYING.

MR. GEORGE ROBERTSON, TRAVERSE CITY.

Mr. Chairman, Ladies and Gentlemen:

About the most pleasure I ever got out of dairying was running away from it, getting rid of it, but there are I think pleasures to be derived from dairying. In the first place we must like the business and if we like the business we take some pleasure in it. If we like it well enough to work out the details of dairying we have an interest in it, and one has to like it in order to make a success of it.

In the first place, in order to get much pleasure out of the business we have to make it pay; in order to make it pay we have to have the right kind of cows, we have to feed them the right proportions of feed and we have to make a little money over and above what it costs to feed the cows in order to get much pleasure out of the business. I am speaking now more of making butter, and in order to get much pleasure out of it we have to make an article of butter that will please our customers, there is quite a bit of pleasure in that. Then again we have to do a cash business in order to get very much pleasure out of it, and we

have to have the right kind of customers in order to do a cash business. If we can make the right kind of butter there will be no trouble about getting sale for it, we will always have plenty of demand for the butter. Good butter will sell almost anywhere at a good price, and if you please your customers you will never have to look for a market for your butter, you will always have someone inquiring for it. Therefore there is much pleasure in making good butter, having good customers and getting good prices for your produce. Then again we have to have customers that are willing to do a cash business, and there is a pleasure in selling your butter for cash and having the money to meet your obligations—that to me is the most pleasure of all.

So far as my experience goes there are a whole lot of good customers in Traverse City. Perhaps my wife could tell you more about the butter end of dairying than I. I furnish the cows and feed, she makes and delivers the butter and pockets the cash too and she pays the grocery bill. I do not have to bother with any grocery bills. It is well enough to have money crops to have a few beef cattle to sell but with the dairy business you do not have to go to a creditor and say Mr.—, you will have to wait until I sell my potatoes, or wheat." It is well enough to have those things to sell but the point I would like to make is that the cows will pay your running expenses. You do not have to ask for credit anywhere, you have the money in your pocket to meet your obligations as they come along.

The Chairman: Is Mr. S. B. Cate in the room? Mr. Cate was to give us a short talk on by-products of dairying, and in his absence I will ask Mr. Hull to talk for five minutes on that line.

### BY-PRODUCTS IN DAIRYING.

MR. N. P. HULL, DIMONDALE.

Mr. Chairman, Ladies and Gentlemen:

The ordinary by-products of dairying are skim milk, buttermilk, manure and calves. Mr. Ransom says about all the profit he is getting out of it is the by-products. Of course he does not have the skim milk or buttermilk. What is the actual value of the by-products? Suppose we do not get anything but the by-products, that is not enough of course, but suppose we just get those by-products, what is the value of the ordinary by-products? What can we afford to pay for skim milk, with the price that concentrates bring up here in this country? If we feed the skim milk generously we can afford to pay forty cents a hundred to feed hogs; that will actually take the place of 40 cents worth of ground middlings in a ration to pigs. The buttermilk is worth as much as the skim milk to feed to hogs, and there is a great scientist who says it is the thing that is going to prolong human life because the lactic acid bacteria there destroy the bad bacteria in the intestines, so if we consume a much larger quantity of buttermilk we will prolong our

lives, and if we may prolong our lives for ten, fifteen or twenty years with buttermilk this by-product is of considerable value, because that is the thing we are all looking for.

The calves, I do not know what you get for them here. We sell calves at a day old for \$2.50. That is the price we put on them and one man contracted to take all our calves this year at that figure. Of course we save a few of the best heifer calves from the best cows.

The manure, scientists, that friend Ransom has been telling us about, say that the manure for a year from a well fed cow is worth from \$23 to \$27. If that is so and friend Ransom has fifteen cows, he has made a considerable profit since last November and will by next November make considerable, just from the value of his manure. Now there is always a question arises in my mind whether that manure is worth \$25; I question somewhat, the way it is handled, whether it may be worth that, but if it is handled judiciously I cannot see why it should not be worth fully that, that is \$25.00. Take the amount of nitrogen, the amount of phosphoric acid, the amount of potash at its actual value, give the cow credit for the amount of nitrogen, phosphoric acid and potash she produces at their commercial value. We will not get the commercial value out of it, in all probability, because we do not put it on just where the land needs it and in just the quantities the land needs. If we did it would be worth \$25 just as much as the commercial fertilizer, but the fact is we do not get it on in a balanced way; we get an excess of nitrogen in this raw manure, and that is what makes the manure valuable, but here is something that we have not figured on that farm, and that is the value of the humus or organic matter, which I believe is of more value to the ordinary farmer, does more to help him produce good crops, than does the nitrogen, that expensive element in the manure; and so if it is spread thin and handled right on the farm it seems to me that it can be worth in actual cash to a man \$25. The difficulty is we do not see it come back as we would if we received \$25 from it; but the man that goes on a farm for a series of years, could he put the manure on a part of the farm and figure the cost of growing the crops and the profit there is on that part of the farm, for twenty years for instance, and then figure the cost of growing crops on the other part of the farm where he had put no manure, I believe he could see where he actually did get the cash value, that is is worth that every time.

The Chairman: We are going to give Mr. Barney a few minutes on "Some Objections to Dairying."

## SOME OBJECTIONS TO DAIRYING.

MR. R. BARNEY, TRAVERSE CITY.

Mr. Chairman, Ladies and Gentlemen:

It is rather embarrassing to get up at a dairyman's institute and take the other side of the question.

In regard to this dairy business, I have given it very careful consideration and it seems to me that it is almost necessary to keep stock on the farm in order to keep the farm up but I have felt a good many times like a little girl who said to her mother "If I get married must I have a man like papa?" "I hope so, my dear." "If I don't get married must I be an old maid like Aunt Mary?" "I think so." "My gracious, what a fix we are in." I feel that way about dairy cows. I hated to keep cows and have to milk like some folks and I hated to keep beef cattle, but it seems to me we have to do one thing or the other. I prefer beef cattle for the reason that I do not think there is as much slavery about it as about dairying, in my opinion, when you figure what the average farmer has to put up with to get a pound of butter. Some men go into the dairy business on a larger scale and feed their cows right, but do any of you believe that one man in twenty feeds his cattle right in this Grand Traverse region, feeds a balanced ration, as Mr. Lillie told us if we do not feed a balanced ration we are losing money? I believe there is not more than one man in twenty in the Grand Traverse region that does do it.

There is a great deal of work in it and expense when you figure the charges from the time you milk the cows, set the cream, raise it and churn it, sell the butter and receive our pay, even if we have ideal customers, such as brother Robertson has been telling us about. I could not help but think when he was describing the ideal customers that they are scarce, like the ideal husband or ideal wife. That is the way I think it is in dairying. For instance, if you can sell the milk at the farm there is a good deal more chance of making money out of dairying than there is in making butter, and there is more chance for profit in retailing the milk than there is in making butter; but where you make your product into butter, milk the cows, set the cream, churn it and peddle the butter, there is no man but would figure his time worth more than the butter would bring him. It would cost me about ninety cents a pound to do that, and butter is sold for 30 cents and the farmers think they are making a profit out of it.

That is not all, it seems to me that this dairy business is the most confining of anything that I know of. I think it's worse than a ninety days sentence in jail because it is the 365 days in the year. You ask women what they do not like about housework and they will tell you washing dishes because it is three times a day, and every day the same thing over again. Milking is worse than washing dishes because we can go to the neighbors once in a while and skip a meal, but we cannot leave milking from one time to another. If I could find a cow that

did not have to be milked twice a day I would buy her. I have a cow now that is broke so she does not give any milk.

It seems to me, when you figure this thing from all sides, that a man or woman—the women I think have the hardest part of it, gets little out of it. There are lots of men willing to let the women do this hard work, but when you figure what is costs to make a pound of butter I believe the person that makes a pound of butter makes more motions for a cent than any other living person. I cannot see why people persist in doing that on an average. I do not believe there is one man in twenty that goes into the dairy business and keeps from four to five cows that makes any money out of it. In my opinion dairying is the hardest, most confining business in the world; if you want something that will make slaves of your wife and family, go into the dairy business. I have no words to describe the things necessary to follow up day after day in the dairy business in order to make a success of it. There is nothing I think of that requires more work and careful attention than dairying.

#### DISCUSSION.

Lady: I take exception to brother Barney's remarks regarding a dairyman's wife. I am a dairyman's wife and I am not a slave.

Member: We have sold butter in Traverse City and never had any trouble.

Mr. Harris: I would like to ask Mr. Barney what he considers an ideal customer? I have several.

Mr. Hull: Friend Barney suggests that this is going over the same thing continually and he gets awfully tired of it, there is no redeeming feature to it. Do you dislike this idea of eating three meals a day? If you enjoyed milking there would be no slavery to it.

Mr. Barney: I would enjoy dairying if I could get the benefits from it I get from my meals, but when it comes to working for them I do not think that is to be considered. I think there is a difference. I never heard anybody complain about the money he received. It is when people have to pay out for feed to their cows they complain.

Mr. Robertson: I believe it would take \$1.10 to get a pound of milk out of any of Barney's cows.

Member: Did you ever figure how much it cost to raise a calf until it was three years old? How much would it cost to raise it for beef?

Mr. Barney: Yes I have. I found I could not afford to do it.

The Chairman: Is Mr. Woolsey in the audience? He was to give us something about the Resort Market for Dairy Products. Is Mr. Black present? Our next is "Cooperation" by Mr. Saunders. Mr. Saunders is busy so he has asked Mr. Brown to take his place.

## COOPERATION.

MR. BROWN, TRAVERSE CITY.

Mr. Chairman, Ladies and Gentlemen:

Mr. Saunders is rather busy, he is ill at home. He phoned me about fifteen minutes before 12 today to take his place. I told him I could not make a speech and he said he knew it, and that is the reason I fill his place.

I suppose the object of having this subject on the program was to have the city people or merchants cooperate with the dairy people. It is a subject in which we, as merchants, are vitally interested because we buy a good many of the products of the farmer and we have to sell them, we buy a good many different kinds of merchandise and have to sell them all to get a profit. We have to cooperate with the farmers, with the manufacturers and with all the others who carry out this proposition.

We buy almost everything on quality and sell it the same way, with the single exception of butter. If we go to buy a piece of broadcloth we take into consideration the wools put into it, the fineness of its wool, the process of manufacturing it, the weaving of it and the finished product. That is the last and chief consideration, is the finished product. You come into our store to buy and that is what you see, that is what you gauge the whole situation by, and you buy it upon its merits as a finished product; but when you go to buy butter, you simply buy butter and if we undertake to buy it on quality we have to face something that is not pleasant to consider. Now why should we not buy butter on its merits? I do not believe the average cow gives bad milk to make bad butter, but we do get some butter at the store that we cannot always sell and we would like very much to cooperate with the farmer to produce a quality of butter for which we could pay a uniformly good price and sell it without any hesitancy.

Other merchandise is bought and sold upon its merits, and why cannot we buy butter in the same way? We buy apples on their merit, we buy hay, potatoes, and other products on their merits, nearly everything except milk and butter. We sent a bottle of milk up here the other day and had it tested. I am informed that it was the poorest quality of milk that was exhibited here. This milk was not produced by the man who sells it; it is my opinion that he gathers it up all over the country, and it is a mixture of the good, bad and indifferent milk he gets.

We know cooperation is the real law of life and progress. That is as true as can be of anything. If we want anything to grow and prosper we have to cooperate in some way or other. The smallest form of life when it comes into existence, whether animal life or vegetable life, needs fostering, caring for, building up. If it gets opposition it twists and dies or if it lives at all it is a stunted specimen of life. We can cooperate with you as you get better cattle and better stock and better milk by paying you better prices.

I was very much interested in what one of the speakers said, to the effect that he had no difficulty at all to find customers who would buy his product because when he had a good product the customers told each other and the butter advertised itself. That is very true, and we are trying, I believe all the merchants are trying to encourage the production of better goods. It is a safer proposition for a merchant to sell good goods than to sell poor goods, because there is no after reckoning, there is nothing to settle up later; but if he sells a bad article it is liable to come back and he has to stand the loss.

It is a mistake, I think, for the farmer to think that the merchant and customer in the city are trying to beat down prices. I am quite sure that the average person who is trying to buy good merchandise is willing to pay the full market for it. The time when we are going to cooperate with you is when you bring the finished product to us. You help to make the market and we help to make it, and if we can get an article that gives universal satisfaction we are willing to pay more for it. It is now a common thing to go into a city store and find three qualities of eggs and sometimes as high as fifteen cents a dozen difference in price. The man who pays the highest price for his eggs in the end gets the cheapest, for they are larger, better, cleaner and fresher. That is true of all other products you bring. It is unfair for us to put a uniform price on your products, pay you a uniform price for your product irrespective of what you bring us. If you will help us, operating with us in sustaining high prices for high quality and moderate prices for moderate quality, you will bring about the same thing we are trying to accomplish, better cows, better product, better prices. It costs no more to sell a better quality of goods than the cheap quality; it costs you no more to feed the best cows than the cheapest cows.

I am not altogether out of my line when I am talking of dairying, or dairymen and dairymaids. I was born and raised on a farm and there is very little about farming that I have not done. I have milked many a cow, helped my mother at churning too and brought the butter to the market, so it is not a foreign proposition to me, and I really know there is more waste in the execution of the average farmer's business, more carelessness in regard to milk, than any other business on God's green footstool.

I was glad to hear one of the speakers say he liked a cash business. That is where many a farmer makes a mistake. There was a milkman at our house the other day. He said he had over \$100 standing out and his largest account was \$2.50. I feel sorry for the man's future in the dairy business. I also see a man here who sells the best cream that is brought to Traverse City. His cream passes the government test and has a nice margin left. I believe we are paying him over the market for it, but we get our money's worth every day that we buy that cream. Speaking about the ideal customer, I would gladly pay above the market at any time for goods that are above the market. My wife can take a bottle of that cream and keep it nice and sweet for a whole week. If we get cream from some of those mixed dairies that I spoke about and the milk will not keep over night on ice. That is the difference between a good product and a poor one. We are perfectly willing to pay 25 per cent more for the better class of goods.

We can cooperate with you in that respect. If you can furnish us perfect goods we will pay you more money for them, as consumers and merchants, and it is a pleasure to buy that class of stuff. It is not pleasure to buy cheap goods at any price at all. We have tried an experiment in the store of taking a miscellaneous lot of eggs, taking the fresh eggs out and putting an extra price of ten cents a dozen on them, calling the customers' attention to them, and we sell nine times out of ten. They want the fresh eggs, the average person wants to live the best he can. The more attention you pay to your goods the more profit there will be in the business for you. I thank you.

#### DISCUSSION.

Mr. Leshar I would like to ask just one question. The subject that was omitted is the one on which I desire some information. As a member of your association, I feel privileged in asking a question, and therefore ask that Mr. Lillie, in a few words, give us some of the advantages in selling to a creamery, so that I may bring something home to my people and tell them any new suggestions I have.

Mr. Lillie: In the first place, if you have large dairy interests in a community you will not have a home market for your product. If all the farmers around Traverse City had a large herd of cows on their farms they would find they would have to go beyond Traverse City for a market there would only be a few that could get a market here. The creamery becomes necessary when you reach that condition that you have to ship your product of butter largely out of your own community.

Of course a farmer living on a farm out in the country cannot afford to bring in his butter and peddle to private customers, because it costs too much; it is only those conveniently located near the city that can afford to do that. The creamery makes it possible for the farmer living far from town to get a profitable market for his product, and it makes it profitable when you have intensive dairy interests and the home market does not furnish a market, it makes it possible for everybody to have a market. You have to ship your product to a commercial center, where the population is, to get the price for it. Traverse City is wonderfully well situated as a market for the dairymen in this vicinity, because in the summer time you have a large resort trade here besides your city trade. That is the way with all this part of Michigan where you can get good prices for goods if you have good goods from the resorters and your staple population in the city; but a few years ago, down in our part of the country, for instance, dairy products were exceedingly low, which came about largely from the fact that there was an over production for the home market. When we built a creamery down there and manufactured butter of uniform quality in commercial quantities we got rid of a great lot of it, we did not have to depend on Grand Rapids for a market, we shipped to New York, Boston, or Philadelphia, put our goods on the best markets the country afforded and there we could sell it for what it was worth.

That is one phase of it. Then the advantage of selling to a creamery. Mr. Barney, in giving us some of the discouraging features of the dairy business, said it was confining. The delivering of the products of a



small dairy to private customers is expensive; you do not have enough so that many times it pays you to make the trip. That is how Mr. Barney figures 90 cents a pound for his butter, and yet if he kept fifty cows on that farm and had a market in Traverse City for all his butter, instead of bothering with a few jars of butter he could come here with a fair size load of butter, that would reduce the cost very materially in the distribution of that product. That is a great thing. When you live out far in the country and patronize a creamery it cuts off this cost of delivery. If a man has a hand separator on his own farm, separates the cream, and sets the cream can out on the stand in front of his house, the cream hauler takes it and delivers it to the creamery; the whole expense of delivering to private customers is gone, he can attend to his own affairs, while if he had to take the product of his little dairy to the market himself it would materially increase the cost of the production of the finished product.

There is another thing. Mr. Barney complains very much about how hard the farmer's wife has to work and I pity the farmer's wife too. I say the farmer's wife does more than her share and I have this to say to Mr. Barney on that proposition, that if he does not feel satisfied with the income from his farm, if he does not feel he is getting all the money out of his investment the same as he ought to do, if he would like to put his family in better circumstances, give them a better education, and that sort of thing, if he feels the necessity of an increased income, and he believes, after looking it over carefully, that a good herd of dairy cows would bring him that income, and yet he is not willing to do the milking, I say he is not playing evenly and fairly with Mrs. Barney, because he does ask Mrs. Barney to get up in the morning and get breakfast, wash the dishes, get dinner and wash the dishes three hundred and sixty-five times in the year, and Barney would rather go out to the barn today and milk ten cows than to get either of those meals and wash the dishes.

When you patronize a creamery the good wife has nothing to do with the dairy business, because no man will ask his wife to go out to the barn and milk the cows. Just a few moments night and morning washing the separator is not as confining as making butter. Making butter is an arduous task. We say we like to make butter, it is an intelligent operation if we make nice butter, and I know of women that are proud of the fact that they can make butter and to them it does not seem to be drudgery at all; but it is confining work because if you make nice butter and have it uniform you have to attend to the cream, churning it when it should be churned, and you have to give the whole process particular attention. You have to attend to it yourself and your nose is on the grindstone the biggest share of the time. Regarding this question of dairying being confining, Hull and I are dairymen and we are up to Traverse City talking to you people and our dairies are going on the same. It is not very confining for us. My friend Hull and I commenced farming as low on the ladder as anybody and the dairy cow has brought us up. If you are willing to go along here with three or four dairy cows year after year, you will always have your nose to the grindstone. You have not investment enough so you can afford to hire anybody to do the work for you, you have to do it yourself; but

if you have faith enough in the dairy cow so as to build up your herd to a commercial proportion, you will have investment enough so you can afford to hire the work done.

Now then, with the creamery it makes it possible for a man to go into dairying in a commercial way, and in that way you can make your plans and carry them out. If you simply have private customers you cannot go into the business in a commercial way unless you give the work your entire, undivided individual attention every day in the year, while with a creamery you can put one hundred cows on your farm if you can take care of them. Your market is sure, it is uniform, you are relieved from the labor of manufacturing. All you have to do is to produce the cream and put it on the stand in front of your house. You can go into the business in a commercial way and get it so it is not confining if you are a business man, and make a profit out of it. If you had a dollar last November you can have two of them today.

Member: I would like to ask Mr. Lillie a few questions in regard to a cooperative creamery first, and next where to get a good milk tester from four to six or more bottles? Is it profitable to start a cooperative creamery after you have a number of cows?

Mr. Lillie: If you have a sufficient dairy interest, a sufficient number of cows within hauling distance, a cooperative creamery is certainly feasible and profitable. The farmers have to run it. It is a good thing for farmers because it gives them an insight into business. I have been at the head of a large cooperative creamery for sixteen years. There is no question but any bunch of farmers can run a cooperative creamery successfully. The reason why so many creameries fail is because they do not have milk enough to make a success out of the business. If you get a good buttermaker you have to pay good wages and he must know how to make butter and handle the cream, and in order to pay him and the other expenses of operating the creamery you have to have a sufficient amount of raw material so as to do it and not charge exorbitant prices for doing it.

Member: Which is the better to have, a cooperative creamery or an individual creamery?

Mr. Lillie: Wouldn't you rather have an interest in the business, wouldn't you take more pride in it, wouldn't you be more satisfied if you had an interest in the creamery so you could go there and talk with other men who had a like interest in it, and know how it was operated, know whether you were getting what was coming to you, than to have an individual own it that you cannot learn anything about? What a farmer does not know he suspects, and many times when he does business with the individual he suspects he is not getting a square deal, when he may be, but if he handles the creamery in a cooperative way he knows and that makes him more satisfied.

Member: If it is started right.

Mr. Lillie: It is part of your business to see that it is started right. As to where to buy a Babcock tester, you can buy it from any Creamery Supply House. You can buy it of Ladd Bros., of Saginaw, of the Creamery Package Co., of Chicago, or any other supply house.

Member: There is another question. Can you explain to me why we have to pay 80 per cent more freight from Northport to Traverse City for our cream than we did six months ago? It started at 15 per cent

more and a week after that it went to 80 per cent. Some of us are shipping cream up here and we do not feel right about it.

Mr. Lillie: I can tell you briefly the history of that case. The railways of this state were asked to make a special rate to get milk into the big cities. The people wanted it so they could ship milk and cream to the big cities, twenty-five or thirty miles from Detroit for instance, they could not wait for freight trains. So the people in the city co-operated with the milk producers and got the railroads to take milk as baggage on the passenger trains. For instance, the passenger train for Saginaw, when it got beyond Plymouth would stop and take a lot of milk in the baggage car, to deliver in Detroit early. They made a special low rate so as to get milk into Detroit as cheaply as possible for the benefit of both the farmers and consumers. Then they established that precedence that they would take milk or cream as baggage. The first they knew, out here in the state somewhere, there would come an application from the agent for the rate on milk or cream and somebody wanted to ship cream to some creamery. The railroad companies did not think much about it and they extended the courtesy for those people. There was no law about this, it was the courtesy of the railroad people. Before they realized what they had done, that applied all over the state of Michigan, they gave the same rate as for hauling fresh milk into the city of Detroit. After a while the people of Michigan demanded that the railroads have a rate of freight on communities fixed by commission and demanded that the railroads carry passengers all over Michigan for two cents a mile, and the railroads felt that they had been asked too much. You can see how they might feel, consequently they said "Here this question of hauling milk and cream all over the state of Michigan in our baggage trains is nothing but a nuisance; some times it spills over the cars and we are bothered about it, and the people will have to pay for it. We have been handling it to cheaply and if we are going to do that business we will have to have something like a fair revenue for it," and they put up the price and you have to pay more. The creameries which were interested in this, because that was going to affect them went after the state railroad commission and got them to get the freight back again. The railroad companies all over the United States increased the transportation on milk and cream. The centralizers took it before the Interstate Commerce Commission. In this state the price of cream, so far as interstate commerce is concerned, is as low as it was in the first place, not quite but nearly; but the railroads in Michigan increased the price quite a little. The railroad commission came down about half, is now about half way between what the old rate was and the new rate the railroads asked. The railroads in the state of Michigan can charge what the railroad commission will allow, but if you wanted to ship to Chicago they would have to charge at the rate fixed by the interstate commerce commission.

The Chairman: Does the secretary wish to make a report?

## REPORT OF SECRETARY OF THE GRAND TRAVERSE ASS'N.

MR. HARRIS.

Mr. Chairman:

We have twenty-five paid memberships at the present time. At the beginning of this meeting, there was in the treasury \$4.75, which leaves about \$1.00 to raise by subscription in order to turn the fees over to the State Association and pay for our expenses. That is all I have to report.

The Chairman: Mr. Hull will now address us.

## SUGGESTIONS TO IMPROVE THE DAIRY BUSINESS.

N. P. HULL, DIMONDALE.

Mr. Chairman, Ladies and Gentlemen:

What do we want to improve in dairy conditions? I suppose if we are in the dairy business, most of us are not in it for the pleasure there is in it. The reason we are in it is because we want to put in our time in such a way as to enable ourselves to provide against our old age and support our families, surround them with the pleasant things of life as we go along, and a good many of us have conceived the idea that we can do that better in dairying than in any other way, but now I am sure if only enough of us stop to consider this proposition, that the profits we get out of our dairying for a year measures the value of the part of our life, that is that part of our life that we put in the dairy portion, it seems to me if people engage in this would stop more often and think that the profit there is in it measures the value of that part of their life in it, they surely would feel it essential to get as large a profit out of it, that they might make that part of their life they put into it as valuable as possible. We want to get that profit, we are working for it and if we can improve that profit, make a greater profit from the business, make more difference between the cost of producing a pound of butter and the selling price, it seems to me that is the only thing that will improve dairying more rapidly and more effectively than anything I can suggest.

There has been some question here about whether dairying was profitable. I want to read a report that I have of two cows last year. I am willing to admit that you will not all go home and make equally as good a report as this if you do your best, because it takes a good many years to get such a herd as this, but I want to tell you what this man is doing, and I will tell you in a moment how he is doing and how other men are doing, and then it is simply up to you whether you will do it or not. It is up to you whether you improve dairying or not. We come up here and give you the suggestions from the best of our ex-

perience how to do it, but we are not going to stay and milk the cows nor feed them. This man's record for last year was: His best cow gave 14,508 pounds of milk. There is nothing so remarkable about that, many cows do better than that. I had a cow that did better than that, you had them here that did better than that last year. The remarkable thing about this herd of cows was, not that the best cow gave 14,508 pounds of milk, but that the poorest cow gave 10,322 pounds of milk, and the average of his herd was 12,253 pounds. This man got a little better price, perhaps, than the average man who is making butter for four months in the year, for he received \$1.75 per hundred. He shipped his milk to Toledo evenings and mornings for four months and received \$1.75 delivered Toledo, but he took the baggage charges out before he gave credit to the cow, he credited the cow with the net proceeds. For eight months he sold his milk to a cheese factory and received from the factory for the best cow \$190.82, and from the poorest cow \$132.64, and from the average cow \$160.14. Now his daily ration was 12 pounds alfalfa hay, four pounds mixed hay, 34 pounds corn silage, 2½ pounds oil meal, 4 pounds middlings, 3 pounds gluten meal, one-half pound salt. It cost him for the year \$55, so that he had a net profit of \$105.14 per cow, to say nothing about the by product, and the by-product brought him a good deal, enough to make his profit \$59 more. Of course he had a thoroughbred herd and that is something we may not all have. He did this thing. How did he do it? What made it possible? I am going to give you a hint now that it was the man behind the cows that made the profit, and if there is one thing we want to improve dairying in Michigan and up here in Traverse City it is to improve the man behind the herd of cows, and if he gets the right herd the right man will make a profit. It is a business that it is possible to make a splendid profit out of in Traverse City or in any other part of Michigan, but it takes the man behind the cow.

This man put intelligence and care into his business, and to improve dairying in this section or any other section that is what is necessary and nothing else will do. There is no business in this section of the state will pay better if you put that intelligence and care into it than dairying, but if you do not do that you do not want to go into the dairy business you will not make a success of it. This man, Mr. Standish, last year at Lyons, Ohio, made a big success out of the business. He started in twenty years ago with \$100, enough to buy a team, ran in debt for a good farm down there. He said this year he is going to finish paying for that farm, and he has improved the buildings considerably. How did this man do that? He started in with two or three cows; as soon as he could, he got one or more thoroughbreds and the next thing he did was to know what it cost him to feed those cows and what the cows paid him, and the reason Mr. Standish's poorest cow gave ten thousand odd pounds of milk last year was because he got rid of the cows that would not do that. He did not care to put in his time growing feed, feeding it to the cows, milking the cows and taking care of the product if the cows would not yield enough milk to make him a good profit. How did he know? He used his brains, and the brains is the great quality to figure on in dairying today. That man not only studied the cows, knew what they cost him, but he studied the best way

to feed and care for those cows. He furnishes them everything he can in the way of comfort. They are dehorned, that means that each cow has an equal chance, and every cow is furnished with comfortable quarters and given \$55 worth of feed a year at the ordinary market price and by his care of his herd of cows they yield him \$160.14 per cow for milk.

I perfectly agree with what Mr. Lillie has said, that for a community cooperation is best. I agree with Mr. Raven that with a breeders association you get together and improve your herds more quickly and cheaply by so doing, have a testing association, cooperate in that way, arrange your standard and guide your selection by the findings of this dairy tester; but if you cannot do that, if your community will not take hold of it, if you have enthusiasm enough, if you care enough about making a success to say "I will make a success of this thing," just as this man Standish that went into it in Ohio and went in to do it. That is the proposition. He simply said that he had confidence in the cows that they would do it. He got a Babcock tester and scales and he knew just exactly what every cow was doing for him and he would not keep a cow that did not pay. He studied the matter of caring and feeding the cows he kept to make them return the most profit, and by so doing that man has won out. You can win out in the same way and I do not know of any other way by which you can win out.

Now only have I to back me today my own experience and the experience of Mr. Lillie but going up and down this state of Michigan, backward and forward, across the state of Illinois, traveling and talking with the best dairymen of Iowa and Ohio, all those dairy states, I have yet to find a man that is making a maximum success of dairying that is not following along the same lines. He is using his intelligence, he knows whether the cows are paying him and he gets rid of the cows that do not pay a profit; and then he uses his intelligence to know how to feed those cows that he selected and how to take the right sort of care of them; and analyzing it, that man's intelligence and care has put that man that has followed those lines on a business basis and a profitable basis in Michigan, and while doing that he has raised the fertility of his farm. That is the only royal road to success in dairying that I know of. The same old road that every man has traveled since we commenced dairying in Michigan, and why do not more men follow it? You say "I do not know." They are putting in their time growing feed, feeding the cows, milking the cows and taking care of the product, and when the end of the year comes there are a great many no better off than they were at the beginning of the year, but have the satisfaction of knowing they made a living by putting in their time, and perhaps had the dollar they started with, as Mr. Ransom had.

A man can make slavery of almost anything if he does not take interest in it. I do not object to milking three or four times a day and Mr. Barney would not if he enjoyed milking. If he puts intelligence into his work and sees things coming his way he will enjoy it, and if he enjoyed it he would rather milk twice a day than do something else he does not enjoy, and when a man begins to analyze his intelligence, to use enough intelligence to handle his business in an intelligent way there has to be results and he sees the results for himself, that he is

spending his life to better advantage because he is cooperating his brain and his muscle, and I am sure that man gets interested in this business and when he does that there is no burden about having a steady job, that is what the man must have; no man ever made a success that did not have a steady job.

Friend Barney says it is confining. I admit we have to be there and attend to the dairy business if we make a success of it, but if friend Barney will tell me some business that a man has not to attend to to make a success of, I would like to know what it is, for I do not know of any business that a man can make a success of and not attend to that business.

#### DISCUSSION.

Mr. Barney: General farming will pay better if we follow details as closely as you say we have to in dairying.

Mr. Hull: If you follow a general line of farming, how will you practice it without some line of live stock husbandry and feed the roughage on your farm?

Mr. Barney: I think beef stock is preferable.

Mr. Hull: You take the amount of feed that is necessary to make a pound of beef steer, worth nine or ten cents a pound, and feed it to a good dairy cow and you will make it worth thirty cents. I had been talking to the dairymen in Tuscola county, and a man said to me "You gave it to the steer feeders rather hard. You have been telling that dairying is more profitable than steer feeding." I said "I think it is." "I would like to know how you make it out." I put up this proposition to him. He admitted that it would take as much to feed a two year old steer in a year as a good cow. The fattening steer will bring \$60, and when you sell that steer you have \$60, but the steer is gone. From my cows last year I sold \$100.16 worth of milk and I have the cows yet.

Mr. Barney: How much more time did you put in milking the cows than you would if you had steers?

Mr. Hull: I put in a little more but not enough to make up the difference. I said "My friend, you have to keep those steers from the time they were born until they are two years old; you commenced feeding last year and realized nothing from them, while my cows last year yielded \$93 worth of product. You say you buy the steer calf. I admit where you can steal from the other fellow you are making that much gain, but that is not against dairying nor in favor of the steer. If you are fortunate enough and get it from the other fellow you are all right.

The Chairman: Just a word before we close. There is not one of us but would like to hear Mr. Hull speak again, and if you are grangers you will hear him speak here in December.

I believe that closes the convention, and I thank you for your attention.

## FINANCIAL STATEMENT—CURRENT EXPENSE ACCOUNT.

July 1, 1908—June 30, 1909.

## RECEIPTS.

Appropriation from State Treasurer .....	\$500 00
Transferred from Promotion Account .....	23 85
<b>Total</b> .....	<b>\$523 85</b>

## DISBURSEMENTS.

Date. 1908.	Name.	
July 18.	914. W. F. Raven, expenses ex. com. meeting...	\$6 84
Aug. 3.	915. W. H. Bechtel expenses ex. com. meeting..	2 40
Aug. 3.	916. C. R. Webb, expenses ex. com. meeting....	1 92
Aug. 10.	917. Henry Rozema, expenses ex. com. meeting.	8 58
Aug. 24.	918. Hamaker Printing Co., printing sta.....	7 50
Oct. 10.	920. James Button, P. M., stamps for reports...	62 00
Nov. 18.	921. James Button, P. M. stamps .....	5 00
1909.		
Jan. 7.	925. James Button, P. M., stamps .....	15 00
Jan. 26.	926. Mary Carpenter, exp. Tecumseh and Salem meetings .....	24 34
Feb. 23.	937. James Button, P. M., stamps .....	10 00
Feb. 24.	938. J. G. Moore, exp. annual meeting .....	18 00
Feb. 24.	939. U. S. Baer, expenses annual meeting .....	20 00
Mar. 1.	942. C. E. Lee, expenses annual meeting.....	20 00
Mar. 1.	943. W. F. Raven, expenses on by-laws .....	6 00
Mar. 1.	944. W. H. Bechtel, expenses on by-laws .....	6 00
Mar. 1.	945. Herbert A. Jones, expenses annual meeting.	39 00
Mar. 9.	1055. James Button, P. M., stamps.....	11 00
Mar. 24.	1057. Hamaker Print. Co., printing .....	6 00
Mar. 24.	1059. Mary M. Carpenter, exp. annual meeting..	10 35
April 12.	1061. Mary M. Carpenter, sten. rep. Tecumseh, Salem and annual meetings .....	150 00
*April 12.	1062. Mary M. Carpenter, exp. Cranston and Traverse City meetings .....	28 92
April 20.	1063. James Button, P. M., stamps .....	5 00
May 6.	1064. Mary M. Carpenter, sten. rep. Cranston meeting .....	30 00
May 29.	1065. Mary M. Carpenter, sten. rep. Traverse City meeting .....	30 00
<b>Total</b> .....		<b>\$523 85</b>

## SUMMARY OF DISBURSEMENTS, CURRENT EXPENSE ACCOUNT.

Expenses of executive committee meeting .....	\$19 74
Expenses of Annual Meeting .....	197 35
Expenses of committee on by-laws .....	12 00
Stamps .....	108 00
Printing .....	13 50
Expenses of Tecumseh meeting .....	42 17
Expenses of Salem meeting .....	42 17
Expenses of Cranston meeting .....	44 46
Expenses of Traverse City meeting .....	44 46
<b>Total disbursements</b> .....	<b>\$523 85</b>
<b>Total receipts</b> .....	<b>523 85</b>

\*Expenses divided between the two meetings.



## PROMOTION ACCOUNT.

July 1, 1908—June 30, 1909.

## RECEIPTS.

Date.	Name.	
1908.		
July 1.	Balance in fund .....	\$144 17
Sept. 30.	To membership fees at office .....	3 00
1909.		
Jan. 12.	Burnap Building & Supply Co. ....	10 00
" 12.	National Creamery Supply Co. ....	40 00
" 29.	Port Huron Salt Co. ....	10 00
" 29.	Sharples Separator Co. ....	20 00
" 29.	Wykes & Co. ....	10 00
" 29.	Diamond Crystal Salt Co. ....	10 00
" 30.	Fitch Cornell & Co. ....	10 00
" 30.	Membership fees at office .....	5 00
Feb. 3.	Coyne Bros. ....	10 00
" 3.	J. B. Ford Co. ....	10 00
" 3.	Wells & Richardson Co. ....	10 00
" 3.	A. H. Barber, Creamery Supply Co. ....	20 00
" 6.	Worcester Salt Co. ....	10 00
" 6.	Creamery Package Manufacturing Co. ....	23 00
" 6.	Vermont Farm Machine Co. ....	20 00
" 10.	T. F. Marston ....	10 00
" 10.	Peerless Separator Co. ....	10 00
" 10.	Great Western Cereal Co. ....	10 00
" 11.	J. E. Bartlett Co. ....	20 00
" 16.	De Laval Separator Co. ....	40 00
" 16.	F. E. & W. L. Hodge ....	10 00
" 20.	Diamond Crystal Salt Co. ....	10 00
" 20.	Colonial Salt Co. ....	10 00
" 20.	Empire Separator Co. ....	20 00
" 20.	Cleveland Separator Co. ....	10 00
" 20.	International Harvester Co. ....	10 00
" 20.	Ladd Bros. ....	20 00
" 20.	Butler Bottle Co. ....	20 00
" 20.	Geo. W. Linn & Son ....	10 00
" 20.	Eclipse Box Co. ....	10 00
" 20.	W. A. Mudge ....	10 00
" 20.	Creamery Package Manufacture Co. ....	5 00
" 20.	A. H. Barber Creamery Supply Co. ....	5 00
" 20.	Membership fees at Grand Rapids .....	275 00
" 25.	Hunter, Walton & Co. ....	10 00
" 26.	C. H. Barrett & Co. ....	10 00
" 27.	Omega Separator Co. ....	10 00
Mar. 2.	Membership fees from exhibits .....	109 00
" 3.	Brown & Sehler Co. ....	20 00
" 5.	Chris. Hansens Lab. ....	10 00
" 12.	Pettit & Reed ....	10 00
" 12.	Farmer Handy Wagon Co. ....	20 00
" 15.	Iowa Separator Co. ....	10 00
" 20.	Torsion Balance Co. ....	10 00
" 23.	Herbert A. Jones ....	5 35
" 23.	S. J. Wilson ....	1 50
" 30.	Kneeland Manufacturing Co. ....	20 00
* " 31.	Membership fees at office .....	15 00
April 17.	Auxiliary Members Traverse City .....	15 00
Total .....		\$1,156 02

\*Error in making deposit, should have been \$5.00.

## DISBURSEMENTS.

Date.		Name.	
Sept. 19.	919.	S. J. Wilson, salary July, Aug., Sept. ....	\$50 00
Dec. 10.	922.	Tradesman Co., zinc etching, exhb. hall ....	6 15
" 21.	923.	Hamaker Print. Co., printing .....	3 60
" 21.	924.	S. J. Wilson, salary Oct., Nov., Dec. ....	50 00
1909.			
Feb. 6.	927.	Hamaker Print. Co., printing .....	16 50
" 6.	928.	S. J. Wilson, salary for Jan. ....	17 20
" 8.	929.	S. J. Wilson, office expenses .....	3 30
" 16.	930.	Leonard Exhibition Building Co., railings..	85 00
" 17.	931.	Frank Way, signs .....	4 00
" 19.	932.	Security Transfer Co., rent chairs, and tables	9 35
" 19.	933.	N. J. Velt, janitor .....	6 00
" 19.	934.	Evening Press Co., stereopticon .....	5 00
" 19.	935.	Herpolsheimer Co., decorations .....	15 00
" 19.	936.	Livingston Hotel, exp. speakers .....	20 35
" 26.	940.	S. J. Wilson, miscel. exp. at annual meeting.	25 75
" 26.	941.	Dieges & Clust Badges .....	63 70

---

\$384 90

## PREMIUMS.

Mar.	5.	946.	Chas. D. Morgan .....	\$2 89
"	5.	947.	John E. Ross .....	1 93
"	5.	948.	W. G. Hoffman .....	2 89
"	5.	949.	E. G. Adams .....	10 61
"	5.	950.	Bert. G. Peterson .....	7 72
"	5.	951.	Geo. T. Yetter .....	11 58
"	5.	952.	Jesse W. Cobb .....	4 34
"	5.	953.	S. R. Miles .....	2 41
"	5.	954.	W. H. Bechtel .....	4 82
"	5.	955.	W. H. Renbarger .....	5 30
"	5.	956.	J. L. Bosworth .....	1 93
"	5.	957.	Floyd Hendershott .....	6 75
"	5.	958.	R. G. Hildner .....	2 41
"	5.	959.	Brooklyn Creamery Co. ....	1 93
"	5.	960.	B. A. Hillman .....	3 86
"	5.	961.	T. C. Halpin .....	1 93
"	5.	962.	Archie R. Pierce .....	1 93
"	5.	963.	Walter Hall .....	3 20
"	5.	964.	C. E. Renbarger .....	5 79
"	5.	965.	Geo. P. Sunday .....	7 23
"	5.	966.	Volkert Barnes .....	4 82
"	5.	967.	F. W. Shaw .....	7 23
"	5.	968.	Caleb J. Wilson .....	6 27
"	5.	969.	R. C. Bakkensen .....	6 75
"	5.	970.	Abel Westra .....	4 34
"	5.	971.	L. P. Hensen .....	4 34
"	5.	972.	Glen Overton .....	6 75
"	5.	973.	O. A. Ellis .....	6 27
"	5.	974.	Clyde H. Stroh .....	6 27
"	5.	975.	Marshall Creamery Co. ....	5 79
"	5.	976.	C. D. Lockwood .....	2 89
"	5.	977.	Eugene Austin .....	8 68
"	5.	978.	N. J. Seabert .....	1 93
"	5.	979.	Otto J. Grove .....	5 79
"	5.	980.	F. C. Tanner .....	2 89
"	5.	981.	L. C. Waite .....	7 72
"	5.	982.	G. W. Shopbach .....	2 89
"	5.	983.	J. F. Power .....	4 82
"	5.	984.	C. P. Orrison .....	4 82
"	5.	985.	Arthur Bowman .....	4 82
"	5.	986.	Clarence Walter .....	1 93

Date.	Name.	
Mar. 5.	987. Asa D. Steckle .....	\$3 86
" 5.	988. Bert Siebelink .....	7 23
" 5.	989. J. E. Hebert .....	2 41
" 5.	990. Harry Biersborn .....	2 89
" 5.	991. E. M. Fuller .....	2 89
" 5.	992. Andrew Vivian .....	8 20
" 5.	993. Geo. Myers .....	3 86
" 5.	994. John Vugteveen .....	3 86
" 5.	995. John Strating .....	7 23
" 5.	996. Martin Powell .....	1 93
" 5.	997. Ed. Struer .....	4 82
" 5.	998. Ed. Winter .....	1 93
" 5.	999. Henry H. Faber .....	5 79
" 5.	1000. Vassold Bros. ....	1 93
" 5.	1001. A. A. Hebert .....	5 79
" 5.	1002. John Kloosterman .....	5 79
" 5.	1003. Chas. Bosch .....	5 79
" 5.	1004. Meppeling, H. J. ....	4 82
" 5.	1005. B. A. McGill .....	5 30
" 5.	1006. Albion Cry. Co. ....	3 86
" 5.	1007. Clyde E. King .....	3 86
" 5.	1008. Ravenna Cry. Co. ....	6 75
" 5.	1009. C. A. Finch .....	2 89
" 5.	1010. A. B. Conant .....	4 82
" 5.	1011. John Faber .....	3 86
" 5.	1012. B. F. Hadley .....	1 93
" 5.	1013. E. A. Blakeslee .....	4 82
" 5.	1014. H. Munger .....	2 89
" 5.	1015. Wellington, Best .....	1 93
" 5.	1016. Mrs. M. Southworth .....	1 93
" 5.	1017. D. P. Miller .....	1 93
" 5.	1018. W. H. Oliver .....	6 75
" 5.	1019. Gilbert Harris .....	3 86
" 5.	1020. Mrs. John Munn .....	7 72
" 5.	1021. T. B. Crawford .....	1 93
" 5.	1022. Mrs. Milo Edison .....	3 86
" 5.	1023. Mrs. James Harris .....	5 79
" 5.	1024. Mrs. Ben. Seekman .....	1 93
" 5.	1025. M. B. Armstrong .....	5 25
" 5.	1026. L. R. Sigafosse .....	3 75
" 5.	1027. H. E. Taylor .....	4 87
" 5.	1028. H. E. Taylor .....	2 25
" 5.	1029. Ger. H. Glasser .....	4 87
" 5.	1030. H. P. Fitzpatrick .....	3 37
" 5.	1031. William W. Reed .....	6 37
" 5.	1032. R. L. Ives .....	4 87
" 5.	1033. W. W. Thompson .....	4 12
" 5.	1034. J. G. Dennis .....	3 37
" 5.	1035. J. P. Kaifer .....	6 00
" 5.	1036. J. P. Kaifer .....	4 50
" 5.	1037. J. P. Kaifer .....	3 00
" 5.	1038. W. A. Dear .....	4 12
" 5.	1039. Wm. Blumelein .....	5 62
" 5.	1040. Carland Cheese Co. ....	3 37
" 5.	1041. Zeeland Cheese Co. ....	7 87
" 5.	1042. Curtis & Curtis .....	2 35
" 5.	1043. H. F. Probert .....	3 76
" 5.	1044. Leavenworth Bros. ....	2 82
" 5.	1045. Curtis & Curtis .....	5 17
" 5.	1046. H. B. Wattles .....	6 11
" 5.	1047. H. F. Probert .....	5 64
" 5.	1048. Leavenworth Bros. ....	6 58

Date.	Name.		
Mar. 5. 1049.	C. E. Renbarger .....	\$2 50	
" 5. 1050.	W. H. Renbarger .....	2 50	
" 5. 1051.	Geo. T. Yetter .....	5 00	
" 5. 1052.	D. B. Ketchum .....	7 72	
			<hr/>
			\$491 81
" 6. 1053.	D. W. Richardson, stolen cheese .....	\$6 30	
" 9. 1054.	C. E. Renbarger, butter stolen .....	2 13	
" 16. 1056.	D. P. Miller, butter stolen .....	1 15	
" 24. 1058.	V. W. Tesch, lettering diplomas .....	4 05	
" 30. 1060.	S. J. Wilson, salary Feb. and March to correct over dep .....	29 50	
June 12. 1066.	S. J. Wilson, March 31 .....	10 00	
" 23. 1067.	S. J. Wilson, to correct error in salary on voucher 1060 .....	3 30	
" 23. 1068.	S. J. Wilson, salary for quarter ending June 30 .....	50 00	
" 23. 1069.	S. J. Wilson, office expenses .....	1 35	
" 30.	Transferred to current expense account .....	23 85	
			<hr/>
			131 68
Total disbursements .....			<hr/>
			\$1,008 34

## SUMMARY OF DISBURSEMENTS—PROMOTION ACCOUNT.

Secretary's salary .....	\$200 00	
Premiums .....	491 81	
Badges .....	68 70	
Printing and stationary .....	20 10	
Hotels for speakers, annual meeting .....	20 35	
Erecting railing, annual meeting .....	85 00	
Janitor and Labor, annual meeting .....	26 00	
Decorations .....	15 00	
Rent of tables and chairs .....	9 35	
Signs .....	4 00	
Zinz Etching exhibition hall, annual meeting .....	6 15	
Lettering diplomas, annual meeting .....	4 05	
Stereoptican, annual meeting .....	5 00	
For cheese and butter stolen, annual meeting .....	9 58	
Miscellaneous expenses .....	14 40	
To correct error in over deposit .....	10 00	
		<hr/>
Total .....	\$984 49	
Transferred to current expense account .....	23 85	
		<hr/>
Total disbursements .....		\$1,008 34
Total receipts .....	\$1,156 02	
Total disbursements .....	1,008 34	
		<hr/>
Balance in fund June 30, 1909 .....		147 68
Total receipts, current expense account .....	\$523 85	
Total receipts, promotion account .....	1,156 02	
		<hr/>
Total, both funds .....		1,879 87
Total disbursements, current exp. account .....	\$523 85	
Total disbursements, promotion account .....	1,008 34	
		<hr/>
		1,532 19
Balance in treasurer's hands June 30, 1909.....		\$147 68

OFFICERS OF THE MICHIGAN DAIRYMEN'S ASSOCIATION.

July 1, 1909 to June 30, 1910.

PRESIDENT.

T. F. Marston ..... Bay City.

VICE PRESIDENT.

F. H. Vandenoorn ..... Marquette.

SECRETARY AND TREASURER.

S. J. Wilson ..... Flint.

DIRECTORS.

Leonard Freeman ..... Fenton.

W. F. Raven ..... Brooklyn.

Ira O. Johnson ..... Detroit.

Henry Rozema ..... Fremont.

Charles R. Webb ..... Chesaning.

CHEMISTS.

Dr. C. E. Marshall ..... Agricultural College.

Victor C. Vaughan, Dean of U. of M. .... Ann Arbor.



---

---

# INDEX.

---

---





## INDEX.

---

	Page.
Letter of Transmittal .....	3
Lists of Officers .....	5
Life Members .....	7
Annual Members .....	7
Auxiliary Members, Traverse City .....	12
Appropriation Act .....	13
Annual Meeting, Grand Rapids .....	15
Prayer, Mr. Field .....	17
Address of Welcome, Mr. E. A. Stowe .....	17
Response, Hon. T. F. Marston .....	20
President's Address, Mr. C. C. Lillie .....	21
Report of Secretary and Treasurer .....	27
Executive Committee Meeting .....	27
Secretary's Report continued to .....	34
Side lights on cheese making, Mr. U. S. Baer .....	35
Discussion .....	41
Need of Commercial Starter in Cheese Making, Mr. E. A. Haven.....	46
Discussion .....	49
Making Soft Michigan Cheese with a Curdmill, Mr. L. R. Sigafosse.....	52
Discussion .....	53
Report of Committee on By-laws .....	59
Discussion .....	63
Report of Board of Directors .....	66
Past, Present and Future of the City Milk Supply, Mr. H. F. Probert.....	67
Certified Milk, Mr. L. B. Hall .....	69
Improvement of the Milk Supply, Mr. Ivan C. Weld .....	73
Is it Necessary to Ripen the Cream Before Churning, Dr. Otto Rahn.....	79
Discussion .....	83
Evolution of Creamery Butter Making, Mr. Carl E. Lee .....	89
Discussion .....	96
Address, Mr. S. B. Shilling .....	100
Election of Officers .....	102
Banquet .....	104
Proper Ventilation and Lighting of Dairy Barns, Prof. L. J. Smith, .....	106
Discussion .....	111
Address, Mr. H. J. Credicott .....	114
Discussion .....	118
Cream Rates, Mr. J. G. Moore .....	120
Discussion .....	126
Milk Scores, Mr. Ivan C. Weld .....	126
Discussion .....	129

	Page.
Is it Advisable to Register Grade Cows on Performance, Mr. Herbert A. Jones .....	130
Discussion .....	133
Standard for Registration .....	135
Cow Testing Associations, Mr. Hëlmer Rabild .....	138
Discussion, Mr. A. S. Hawley .....	140
How to Make Dairying Profitable, Mr. Clayton Deake .....	143
Discussion .....	145
"Our Score Card System," Dr. Wm. Delano.....	148
Improvement of Dairy Cattle, Prof. R. S. Shaw .....	151
Response of Committee on Resolutions .....	152
Report of Entries, Scores, and Premium of Butter, Cheese, Milk, and Cream .....	154
Exhibit of Dairy Machinery .....	157
Twelfth Auxiliary Meeting at Tecumseh .....	161
Prayer, Rev. Mr. Shaw .....	163
Response, Mr. C. C. Lillie .....	164
Discussion .....	175
What a Creamery Ought to Do for the Farmer, Mr. E. S. Powers .....	180
Discussion .....	183
Tuberculosis,—How Should the State Attempt to Control, Dr. W. F. Robinson .....	188
Should Agriculture be Taught in the Rural Schools? Mr. M. W. Hensel....	192
Discussion .....	195
Alfalfa, Mr. A. W. Mills .....	203
Discussion .....	206
Profits in Dairying, Mr. C. C. Lillie .....	210
Discussion .....	217
Local Dairy Conditions; How to Improve them, Mr. E. G. Palmer .....	218
Discussion .....	221
Question Box .....	228
Improving the Dairy Herds of the State, Prof. R. S. Shaw .....	234
Discussion .....	237
Thirteenth Auxiliary Meeting at Salem .....	241
Prayer, Rev. Mr. Bettys .....	243
Address of Welcome, Mr. Fred Wheeler .....	244
Response, Mr. C. C. Lillie .....	245
A Co-operative Cow Testing Association for Salem .....	246
Discussion, Mr. Clayton Deake .....	253
How to Improve the Quality of Our Dairy Products, Dr. Floyd W. Robinson .....	259
Discussion .....	266
Question Box .....	271
Dairy and Food Laws and Their Enforcement, Dr. Floyd W. Robinson .....	275
Should Agriculture Be Taught in the Public Schools, Prof. Fred Burnett..	282
Discussion .....	286
What the Dairy and Food Department is Doing for Dairying, Mr. Colon C. Lillie .....	290
Co-operative Dairying, Mr. E. S. Powers .....	294
Discussion, Mr. Will Hamilton .....	297
Contagious Abortion in Dairy Cows, Dr. C. E. Marshall .....	303
Local Dairy Conditions, Mr. H. W. Smith .....	310

	Page.
Discussion .....	311
Question Box .....	315
Tuberculosis, Its Cure, Prevention and Treatment, Dr. C. E. Marshall .....	319
Discussion .....	324
Fourteenth Auxiliary Meeting, Cranston .....	327
Prayer .....	329
Address of Welcome, Mr. E. K. Smith .....	330
Response, Mr. M. P. Howell .....	331
Co-operative Cow Testing Associations, Mr. R. H. Taylor .....	334
Discussion .....	325
Lighting and Ventilating the Cow Stable, Mr. Colon C. Lillie .....	342
Discussion .....	347
Question Box .....	350
Care of Hand Separators and Hand Separator Cream, Mr. E. M. Fuller .....	356
Discussion, Mr. E. S. Powers .....	356
Success and How to Attain it, Mr. N. P. Hull .....	361
The Circulation of the Elements, Dr. Floyd W. Robinson .....	370
Benefits of the Silo, Mr. Colon C. Lillie .....	376
Discussion .....	381
The Proper Relation of One Creamery to Another, Mr. E. K. Smith .....	383
Discussion, Mr. N. P. Hull .....	385
Question Box .....	393
The Object of Scoring Butter, Cheese and Milk, Mr. E. S. Powers .....	401
Discussion, Dr. Floyd W. Robinson .....	403
Commercial Feeding Stuffs, Dr. Floyd W. Robinson .....	409
Discussion .....	411
Proper Feeding and Care of the Dairy Cow, Mr. N. P. Hull .....	413
Discussion .....	421
Fifteenth Auxiliary Meeting, Grand Traverse .....	423
Prayer, Rev. J. W. Millar .....	325
Address of Welcome, Judge Umlor .....	425
The Profit in Poultry, Mr. Chas. J. Ebner .....	427
Discussion .....	429
Address, Mr. N. P. Hull .....	432
Result of Scoring, Prof. Ivan C. Weld .....	438
Discussion .....	444
Improvement of Michigan Live Stock, Mr. W. F. Raven .....	445
Discussion, Mr. C. L. Whitney .....	449
The Use of Farm Manure, Dr. Floyd W. Robinson .....	454
Discussion .....	460
Milk as a Food, Dr. Sara T. Clave .....	465
The Chemistry of Life, Dr. Floyd W. Robinson .....	469
Milk and Cream Contests and a Report of the Scoring in Market Milk and Cream Classes, Mr. Ivan C. Weld .....	478
Composition, Condition and score of market milk .....	483
State Dairy and Auxiliary Associations, Mr. Colon C. Lillie .....	484
Discussion .....	486
Cow Testing and Kindred Associations, Mr. Colon C. Lillie .....	487
Discussion .....	494
Silos and Silage, Mr. N. P. Hull .....	496
Discussion .....	497

	Page.
Election of Officers .....	504
Report of Committees .....	504
Balanced rations, Mr. Colon C. Lillie .....	504
Discussion .....	511
Profits from Dairying, Mr. E. L. Ransom .....	512
Pleasures of Dairying, Mr. Geo. Robertson .....	513
By-Products in Dairying, Mr. N. P. Hull .....	514
Some objections to Dairying, Mr. R. Barney .....	516
Discussion .....	517
Co-operation, Mr. Brown .....	518
Discussion .....	520
Report of Secretary, Mr. James Harris .....	524
Suggestions to Improve the Dairy Business, Mr. N. P. Hull .....	524
Discussion .....	527
Financial Statement, July 1, 1908, to June 30, 1909 .....	528
List of Officers, July 1, 1909, to June 30, 1910 .....	533













८३.